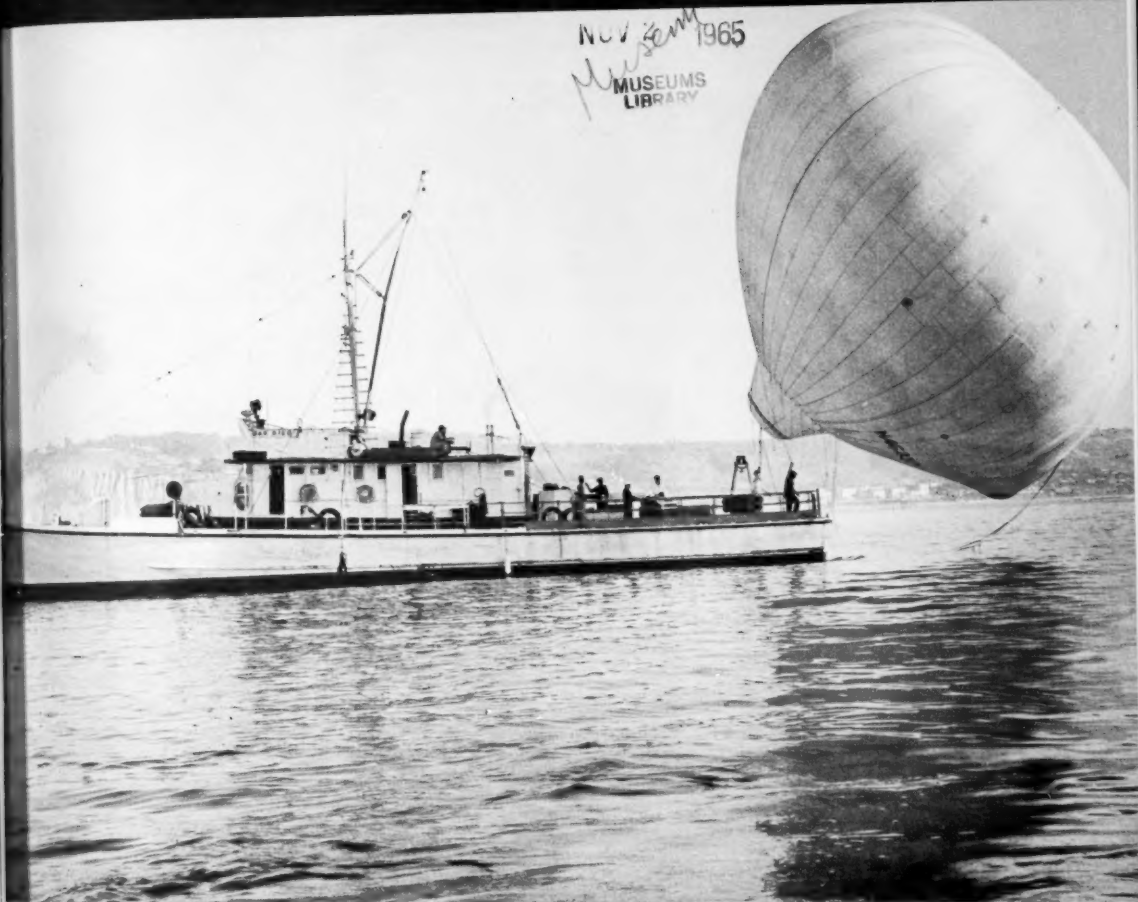


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Page
1
Page
16
16
18
18
18
19
19
19

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COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor
G. A. Albano and H. Beasley, Assistant Editors

Address correspondence and requests to the: Chief, Fishery Market News Service, U.S. Bureau of Commercial Fisheries, 1815 North Fort Myer Drive, Room 510, Arlington, Va. 22209.

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5/31/68

CONTENTS

COVER: Balloons--a new approach to fish spotting. Shown is a hot-air balloon, 50 feet in diameter, being inflated from the deck of the albacore troller Yagui Queen during tests off California in early 1965. Manned ascents were made with the balloon to a height of 500 feet--where visibility extends for 30 miles. The balloon was tethered to the Yagui Queen by a 5/8-inch nylon line. The tests showed that the operation of a tethered hot-air balloon from a vessel at sea is safe and practical under a wide range of working conditions. Improvements in the design of the balloon are needed, however, so that it can be towed by a vessel without hindering its speed. (Note: Additional information about the balloon test may be obtained from the Tuna Resources Laboratory, U.S. Bureau of Commercial Fisheries, La Jolla, Calif. Also see Commercial Fisheries Review, May 1965 p. 18.)

Page	
1	Bottom Trawling Surveys of the Northeastern Gulf of Alaska (Summer and Fall of 1961 and Spring of 1962), by Charles R. Hitz and Warren F. Rathjen

Page	
	TRENDS AND DEVELOPMENTS:
	Alaska:
16	Soviet and Japanese King Crab Vessels Visited by U. S. Biologists
16	Foreign Fishing Activity off Alaska, June 1965
18	New Fishing Industry for Unalakleet
18	1965 Harvest of Kelp and Herring Roe
	Alaska Fisheries Explorations and Gear Development:
18	Bottomfish Resources off Southeast Alaska Studied
19	Shrimp and Bottomfish Resources off Southeast Alaska to be Studied
	Alaska Fisheries Investigations:
19	Karluk Salmon Migrations Delayed
19	Record Naknek Red Salmon Smolt Run Shows Changes in Pattern

Page	
	TRENDS AND DEVELOPMENTS (Contd.):
	Cans--Shipments for Fishery Products:
20	January-April 1965 and January-May 1965
	Central Pacific Fisheries Investigations:
20	Skipjack Tuna Biological Studies Continued
21	First Phase of Trade Wind Zone Oceanographic Study Completed
	Commercial Fisheries Research and Development Act:
22	Grant-in-Aid Funds Apportioned to States for Fiscal Year 1966
	Federal Purchases of Fishery Products:
22	Defense Subsistence Supply Center Moves to Philadelphia and Consolidates with Defense Personnel Support Center
	Fish Sticks and Portions:
23	U.S. Production, January-March 1965

Contents continued page II.

CONTENTS (CONTINUED)

Page	TRENDS AND DEVELOPMENTS (Contd.):	Page	TRENDS AND DEVELOPMENTS (Contd.):
	Florida:		States' Legislation:
23 ..	Fishery Landings and Trends, 1964	47 ..	Actions Affecting Fisheries
	Georgia:		U. S. Fishing Vessels:
25 ..	Fishery Landings and Trends, 1964	47 ..	Documentations Issued and Cancelled
	Great Lakes Fisheries Explorations and Gear Development:	47 ..	U. S. Foreign Trade:
25 ..	Lake Superior Trawling Studies Continued		Imports of Canned Tuna in Brine Under Quota
27 ..	Lake Michigan Trawling Studies Continued	48 ..	Airborne Imports of Fishery Products, January-March 1965
28 ..	Lake Huron Trawling Studies	48 ..	Imports of Frozen Fish Blocks or Slabs, 1959-64
	Gulf Fisheries Explorations and Gear Development:		Virginia:
28 ..	Shrimp Gear Studies Continued	49 ..	Results of Research Discussed at National Shellfish Association Meeting
	Gulf Fishery Investigations:		Wholesale Prices:
29 ..	Shrimp Distribution Studies	49 ..	Edible Fish and Shellfish, July 1965
	Industrial Fishery Products:		FOREIGN:
29 ..	U. S. Fish Meal, Oil, and Solubles:		International:
	Major Indicators for U. S. Supply, May 1965		International Pacific Salmon Fisheries Commission:
30 ..	Production by Areas, June 1965	51 ..	Fishing Regulations Adapted to Protect Early Runs of Sockeye Salmon to Fraser River
30 ..	Production, May 1965		Great Lakes Fishery Commission:
	U. S. Fish Meal and Solubles:	51 ..	10th Annual Meeting
30 ..	Production and Imports, January-May 1965		International Convention for the Northwest Atlantic Fisheries:
	Maine:	52 ..	West Germany Adheres to Protocol Concerning Harp and Hood Seals
31 ..	Fisheries, 1964		Food and Agriculture Organization:
31 ..	University of Maine Resumes Marine Research	52 ..	Preliminary Draft Convention for the Conservation of Atlantic Tuna
	Maryland:	52 ..	Global Regulation of Whaling Urged
32 ..	Fishery Landings and Trends, 1964		International Whaling Commission:
	Massachusetts:	53 ..	17th Annual Meeting Held
33 ..	Fisheries, 1964		Fish Meal:
	New Jersey:	55 ..	Production and Exports for Selected Countries, January-April 1965
34 ..	Federal Grant to Aid Oyster Industry		Codex Alimentarius Commission:
	North Atlantic:	55 ..	Committee on Food Hygiene Holds Second Meeting
34 ..	Soviet Fishing Activity off Coast, July 1965		Australia:
	North Atlantic Fisheries Explorations and Gear Development:	56 ..	Development of Commercial Shrimp Fishery Promising
34 ..	Surf Clam Survey Continued	57 ..	Contributes Funds to Start Fish Farming in Philippines
36 ..	Trawl Gear Evaluations	57 ..	Foreign Trade in Marine Oils, Fiscal Year 1962/63 and 1963/64
	North Atlantic Fisheries Investigations:		Canada:
38 ..	Spring Distribution of Herring Larvae Studied	57 ..	Federal-Provincial Prairie Fisheries Committee Meeting
39 ..	Record Dogfish Catch Obtained in Single Tow	58 ..	New Commission to Study Export Marketing Problems of Fresh-Water Fisheries
	North Pacific Fisheries Explorations and Gear Development:	58 ..	Lamprey Control Experiment Group Headquarters Relocates
40 ..	Hake Population Survey Continued		Ceylon:
	Oceanography:	59 ..	United States Experts Sought to Train Ceylonese Fishermen
40 ..	Coast Guard Cutter "Northwind" to Study Northern Waters		Chile:
41 ..	Proposed "Sea-Grant" Colleges to be Discussed at University of Rhode Island Conference, October 28-29, 1965	59 ..	Fish Meal Production Continued at Low Level in May 1965
	Salmon:		Denmark:
41 ..	U. S. Pacific Coast Canned Stocks, July 1, 1965	59 ..	Pond Trout Surplus Leads Producers to Seek Minimum Export Prices
	Shrimp:		German Federal Republic:
42 ..	Breaded Production, January-March 1965	60 ..	Increased Subsidies for Fishing Industry Asked by Coastal States
	South Atlantic Fisheries Explorations and Gear Development:		
43 ..	Fishery Resource Potentials in Southern Bahama Area Explored		
44 ..	New Fishery Research Vessel for U. S. Bureau of Commercial Fisheries		
	South Carolina:		
44 ..	Fisheries Biological Research Progress, April-June 1965		
46 ..	Fishery Landings and Trends, 1964		

Contents continued page III.

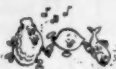
CONTENTS (CONTINUED)

Page	FOREIGN (Contd.):	Page	FOREIGN (Contd.):
	Ghana:		Malaysia:
62 ..	Receives Four More Norwegian-Built Stern Trawlers	72 ..	Expansion of Singapore Tuna Industry Planned
	Iceland:	72 ..	Tuna Fishing Vessels Being Purchased from Japan
63 ..	Export Stocks of Principal Fishery Products, May 31, 1965		Mexico:
63 ..	Utilization of Fishery Landings, January 1965	72 ..	Imports of Marine Oil, 1963-1964
63 ..	Fishery Landings by Principal Species, January 1965		New Zealand:
63 ..	Labor Dispute in Herring Fishery Settled	72 ..	Scallop Industry
	Italy:		Norway:
64 ..	Trade in Japanese Canned Salmon Liberalized	72 ..	Canned Fish Exports, January-March 1964-1965
	Japan:	73 ..	Herring Fishery Trends in the North Sea Area, January-May 1965
64 ..	Frozen Tuna Exports to U. S. and Puerto Rico, March-May 1965	73 ..	Higher Loan Ceiling Approved for State Fisheries Bank
64 ..	Fish Landings at Major Tuna Port, June 1965	73 ..	Fisheries Exhibition, August 19-20, 1965
65 ..	Summer Albacore Tuna Fishery Catch	73 ..	Air-Bubble Curtain Experiments Prove Effective
65 ..	Atlantic Long-Line Tuna Fishery Trends		Territory of Papua and New Guinea:
65 ..	Mostly Albacore Tuna Caught by Long-Line Vessels in South Atlantic	73 ..	Freezing and Processing Plant for Spiny Lobsters Opens
65 ..	Tuna Mothership Catch in South Pacific		Peru:
65 ..	Plans to Stabilize Albacore Tuna Market	74 ..	Fish Oil Exports, January-April 1965
66 ..	Second Government-Industry Tuna Meeting		Portugal:
67 ..	Canned Tuna in Brine Stocks on Hand	74 ..	Canned Fish Exports, January-March 1965
67 ..	Canned Tuna Exporters Ask Sales Company for Price-Quantity Adjustments in July Sales	74 ..	Canned Fish Pack, January-March 1965
67 ..	Salmon Pack Available for Export		Senegal:
68 ..	North Pacific-Bering Sea Salmon and Bottomfish Trends	74 ..	Canned Fish Industry
68 ..	King Crab Production Trends		South Africa:
68 ..	Firm to Use Larger Trawler for Gulf of Alaska Fishery	75 ..	Production of Leading Processed Fishery Products, 1963-1964
68 ..	Bering Sea Shrimp Fishery Trends		South Africa Republic:
68 ..	Firm Plans to Operate Large Trawler in Northwest Atlantic	75 ..	Shark Fishery Expands
68 ..	Fishing Vessels in Atlantic to be Refueled at Sea by Tanker		Spain:
69 ..	Large Fishery Stern-Trawler Research Vessel Planned	75 ..	Frozen Fish Wins Consumer Acceptance
69 ..	Exports of Frozen Rainbow Trout, May 1965		Taiwan:
69 ..	Domestic Fish Meal Market Trends	76 ..	Tuna Vessel Construction Materials to be Purchased from Japan
69 ..	Fish Meal Prices Increase for Domestic Offerings of Factoryship Production	76 ..	Tuna Vessels Ordered from Japan
69 ..	Hokkaido Fishermen Protest Joint Soviet-Japanese Okhotsk Sea Fish-Meal Operations		U.S.S.R.:
70 ..	North Pacific Sperm Whale Study	76 ..	Freezer-Trawlers <u>Pavlovo</u> and <u>Priluki</u> Built for Soviets by Danish Shipyard
70 ..	Antarctic Whaling Fleet Preseason Operation Out of South Georgia Island	77 ..	Big Increase in Fishing Fleet and Catch Planned During 1966-70
70 ..	Whale Meat to be Purchased from Norwegian Whaling Fleet		United Kingdom:
70 ..	Whale Oil Sales Agreement for Domestic Market	77 ..	New Freezer-Trawler <u>Victory</u> Lands Blocks of Whole Frozen Fish
70 ..	Imports of Marine Products Increasing	78 ..	Freezer-Trawlers Emphasized in Distant-Water Fisheries
71 ..	Canned Fishery Products in Short Supply on Domestic Market	78 ..	Conference on Design of Fishing Vessels and Their Equipment in Relation to Fish Quality Improvement
71 ..	Communist China Protests Illegal Fishing by Japanese Vessels	79 ..	Fishing Exhibition Held in London
	Republic of Korea:	79 ..	Radiation-Preservation of Frozen Fish Under Study
71 ..	Progress of Fishing Fleet Being Built by French-Italian Consortium	79 ..	Fishery Loan Interest Rates Revised
			FEDERAL ACTIONS:
			Agency for International Development:
		80 ..	California Firm Gets Guarantees from Aid for African Projects
			Department of the Interior:
			Bureau of Indian Affairs:
		80 ..	Proposed Regulations Applicable to Off-Reservation Indian Treaty Fishing

Contents continued page IV.

CONTENTS (CONTINUED)

Page	FEDERAL ACTIONS (Contd.):	Page	FEDERAL ACTIONS (Contd.):
	U. S. Tariff Commission:		83 .. Eighty-Ninth Congress (First Session)
82 ..	Study of Free Entry of Temporary Imports-- Public Comments Invited		RECENT FISHERY PUBLICATIONS:
	United States District Court:	87 ..	Fish and Wildlife Service Publications
83 ..	Certain Gulf Shrimp Fishermen Held to be Independent Contractors for Tax Purposes	89 ..	Miscellaneous Publications



**OCEANOGRAPHY STUDENTS TRAIN ABOARD
U. S. BUREAU OF COMMERCIAL FISHERIES
RESEARCH VESSEL**

The U. S. Bureau of Commercial Fisheries Biological Laboratory, Woods Hole, Mass., has been cooperating with the Southern Maine Vocational Technical Institute in the training of students in marine technology. Courses in marine engineering, navigation, and oceanography at the Vocational Institute require experience at sea on a training vessel. The Bureau's laboratory agreed to accept a limited number of students on certain research cruises to afford them an opportunity to fulfill the experience requirement. Students selected for the cruise will be assigned to the engine-room, the deck, and the oceanography laboratory, depending on the course involved. Two students were aboard the Laboratory research vessel *Albatross IV* during February 1965, serving as assistants on the scientific party during the North Atlantic winter groundfish survey.



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BOTTOM TRAWLING SURVEYS OF THE NORTHEASTERN GULF OF ALASKA

(Summer and Fall of 1961 and Spring of 1962)

By Charles R. Hitz* and Warren F. Rathjen*

ABSTRACT

The U. S. Bureau of Commercial Fisheries in cooperation with the International Pacific Halibut Commission used otter trawls to survey bottomfish and shellfish on the Continental Shelf and upper continental slope in the Gulf of Alaska. Much of the area surveyed was judged to be untrawlable with conventional bottom trawls used in the surveys. Flatfish made up 43 percent of the total catch of fish and invertebrates. The arrowtooth flounder or turbot was a dominant species at all depths, comprising 60 percent of the flatfish catch and 26 percent of the combined fish and invertebrate catch.

INTRODUCTION

In the summer and fall of 1961 and spring of 1962 otter trawls were used to survey the bottomfish and shellfish on the Continental Shelf and upper continental slope in the Gulf of Alaska. The survey was part of a long-range program begun in 1950 to determine the size of bottomfish stocks in the northeastern Pacific Ocean between southern Oregon and northwest Alaska. The general purpose of the surveys has been to investigate all bottomfish in areas not being fished commercially. Results of previous investigations have been reported by Ellson, Knake, and Dassow 1949; Ellson, Powell, and Hildebrand 1950; Schaefer, Smith, and Greenwood 1955; Alverson 1951, 1953; Greenwood 1958; Johnson 1959; Hitz, Johnson, and Pruter 1961; Hitz and Alverson 1963.

The International Pacific Halibut Commission (IPHC) began a survey in 1961 in the Gulf of Alaska from Unimak Pass to Cape Spencer (fig. 1) to determine the availability of halibut and other bottomfish to trawl gear. Cooperating with the Commission, the U. S. Bureau of Commercial Fisheries assigned the chartered vessel *Tordenskjold* and the Bureau's research vessel *John N. Cobb* to survey that part of the Gulf from the west end of Kodiak Island to Cape Spencer (fig. 1). There has been a considerable amount of interest in what is available to trawl gear in that area, since the Soviets and Japanese began trawling in the Gulf of Alaska. The Soviets were trawling for bottomfish in the Gulf in 1960 on an exploratory basis and by 1963 were involved in large-scale commercial operations. Through 1963, Japanese activities were confined to exploratory fishing and limited commercial operations.

The data collected from both Bureau vessels during the survey have been incorporated with other data (Alverson, Pruter, and Ronholt 1964) into a general analysis of the distribu-

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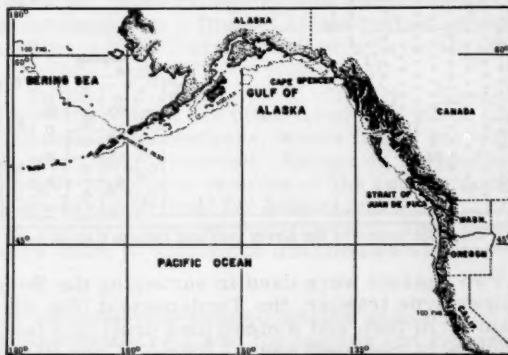


Fig. 1 - The Gulf of Alaska.

tion and relative abundance of demersal fish along the Pacific coast of North America, north of California. This study will relate the detailed features as shown by the surveys of the John N. Cobb and Tordenskjold in the Gulf of Alaska.

The Bureau's aims in this particular trawl survey were (1) to determine the general species composition and relative abundance of demersal fish and shellfish; (2) to obtain accurate records of the bottom topography for determining probable extent of trawlable grounds; and (3) using tags furnished by IPHC, to tag and return to the water all viable halibut captured.

METHODS AND GEAR

A prescheduled sampling pattern was followed in measuring species composition and relative abundance of demersal fish and invertebrates. The sampling pattern followed an overall plan suggested by IPHC for the entire Gulf of Alaska region. The basic pattern provided stations 6 miles apart on sectors at each 15 minutes of longitude with the stations staggered from one sector to the next (fig. 2). Beyond the 100-fathom line the pattern provided stations at depths of 150 and 250 fathoms, regardless of the distance between stations. The lines of stations were numbered from west to east, and each station was designated by a letter of the alphabet starting from the closest station inshore and moving outward. Figure 2 shows the arrangement of the station lines and stations assigned to the Bureau of Commercial Fisheries. Lines 59 to 82 were the responsibility of the Bureau's Exploratory Fishing and Gear Research Base, Seattle, Wash., while lines 83 to 114 were assigned to the Exploratory Fishing and Gear Research Base, Juneau, Alaska.

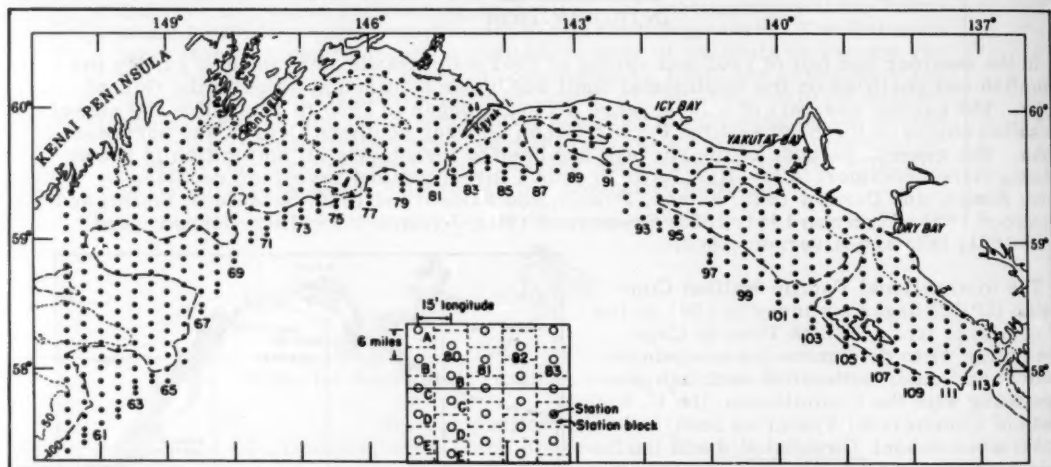


Fig. 2 - The basic pattern of the survey provided stations 6 miles apart on sectors at each 15 minutes of longitude with stations staggered from one sector to the next.

Two vessels were used in surveying the Bureau's area. The Base at Juneau chartered a schooner-type trawler, the Tordenskjold (fig. 3). This vessel has an overall length of 75 feet, a beam of 18 feet, and a mean load draft of 9 feet (Greenwood 1958). The Base at Seattle used the Bureau's research vessel John N. Cobb (fig. 4). It is a West Coast purse seiner in general design with an overall length of 93 feet, a beam of 25 feet, and a mean load draft of 9 feet (Ellson 1950). Both vessels tow their trawls from the stern and haul over the starboard side; the Tordenskjold sets from the starboard side while the John N. Cobb sets over the stern.

A 400-mesh eastern otter trawl net (Greenwood 1958) with a $1\frac{1}{2}$ -inch mesh liner, 100 meshes in length, placed in the cod end of the net to retain small organisms such as shrimp, was used to sample each of the stations. A snag cable 30 fathoms long and $\frac{3}{8}$ -inch diameter

was attached between the otter boards and dragged on the ocean floor ahead of the net. By "hanging up" on bottom obstacles the snag cable minimized damage to the net.

A drag was attempted in each station block (fig. 2); however, since much of the ocean bottom was too rough for trawling, many stations could not be sampled. To determine if the bottom was trawlable, an echo-sounding transect was generally made along the station line. If the bottom appeared level and soft, a 1-hour drag was attempted.



Fig. 3 - The chartered vessel Tordenskjold, a schooner-type trawler.



Fig. 4 - The exploratory fishing and gear research vessel John N. Cobb.

Because of the limited time allowed to survey a rather large area, intensive echo-sounding transects could not be made. Thus, many of the sampling blocks judged to be untrawlable to sampling gear used in the described surveys may in fact contain trawlable grounds which could be located if more thorough echo-sounding surveys were made, or other types of trawl gear were used.

Aside from enumerating the catch, the following data were collected for each station. Location was determined by loran or radar bearings. Meteorological data were obtained and recorded. A sample of bottom sediments was obtained with a Dietz-LaFond bottom grab, and the bottom ocean temperature was taken with either a bathythermograph or a reversing thermometer at the end of each haul.

When obvious snags were not encountered during a haul, the otter trawl was towed for 1 hour. The catch was then brought aboard and dumped into checkers, where it was sorted by species and counts and weights of individual species were recorded. Ranges in lengths and weights were determined for each species. Length-frequency samples of the two dominant species were often obtained. Otoliths and scales were removed for subsequent age and growth determination from representative sizes of the dominant species encountered. When catches were larger than 5,000 pounds, subsamples were taken to determine quantities and sizes of each species.

During the sorting of the catch, all halibut weighing less than 40 pounds were placed into a live box, from which the viable ones were subsequently removed for tagging and release. The larger halibut that were not placed into the live box were tagged from the deck and returned to the sea immediately. Untagged halibut were measured, their sex determined, and the otoliths removed for age and growth studies made by IPHC.

AREA SURVEYED

The Continental Shelf in the Gulf of Alaska is relatively wide, extending some 50 miles seaward as it curves westerly towards Kodiak Island. The continental slope in that area is extremely steep and penetrated by numerous submarine canyons.

Major features of the Continental Shelf surveyed by the Bureau are shown in fig. 5. To the west are a number of well-known halibut fishing grounds such as Albatross Gully, Portlock Bank, and Seward Gully. Between Cape Cleare and Cape St. Elias is a large flat area which forms Middle Bank and the Cape Cleare grounds. Between Cape St. Elias and Dry Bay the Continental Shelf is penetrated by five submarine canyons: Kayak, Tsivat, Icy, Yakutat, and Alsak. East of Yakutat Canyon there are two large flats, Yakutat Bank and the Fairweather Grounds, which are major halibut fishing grounds.

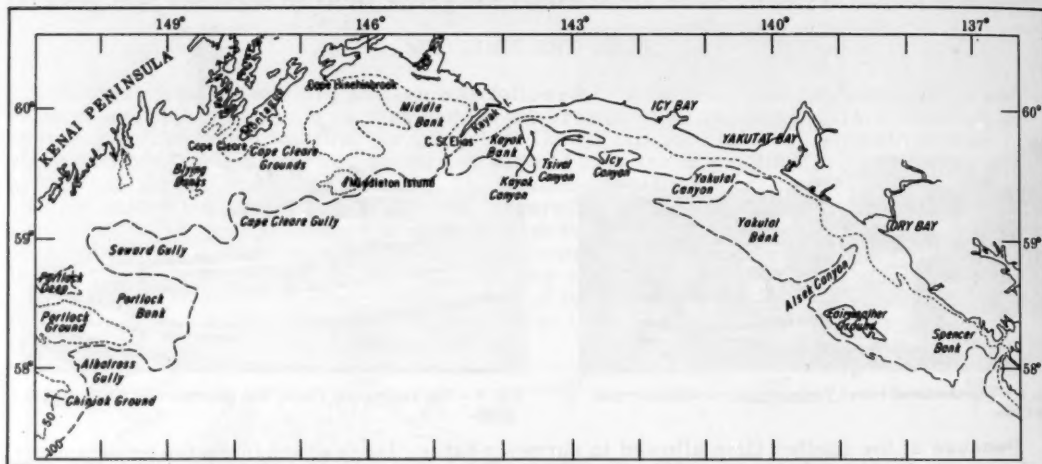


Fig. 5 - Major features of the Continental Shelf and slope surveyed by the U. S. Bureau of Commercial Fisheries in the Gulf of Alaska.

RESULTS

LIMITATIONS OF THE DATA: Major limitations of the surveys are those imposed by (1) the selectivity of the otter trawls used and (2) the seasonal movements of certain species. Otter trawls of the type used in the surveys can be fished only on relatively smooth bottom free of rocks and other obstructions. Moreover, all trawls are selective toward certain species of fish and certain size groups within each species. The work of Soviet investigators (Lyubimova 1962, 1963) in the Gulf of Alaska clearly illustrates this selectivity in trawls. She found that ocean perch were very mobile and as a rule 6 to 9 feet off the bottom, hence a light trawl fished just off the bottom was effective in harvesting this species. On May 5, 1962, the personnel aboard the *John N. Cobb* had an opportunity to observe the Soviet gear in operation (Pruter 1962). The catches appeared to consist entirely of Pacific ocean perch. Many species of bottomfish inhabiting the survey area probably perform seasonal onshore-offshore migrations as well as movements along the coast. Thus, their availability to capture may have been different if the surveys had taken place at other times of the year. These factors undoubtedly influenced the results described here.

SAMPLING EFFORT: The Bureau's survey area had 617 stations. Of that total, 210 stations were considered successful, while 304 were considered unsuccessful, and 103 were not occupied (fig. 6).

Successful stations are defined as those where the net was trawled for 1 hour with no resultant net damage; the unsuccessful stations are those where the net was trawled less than an hour, where the net was damaged, or where echo-soundings indicated untrawlable grounds; unoccupied stations were either missed because of time limitations or because the bottom topography shown on navigations charts indicated they were not suitable for trawling. Approximately 50 percent of the stations were found to be untrawlable to the conventional otter trawl.

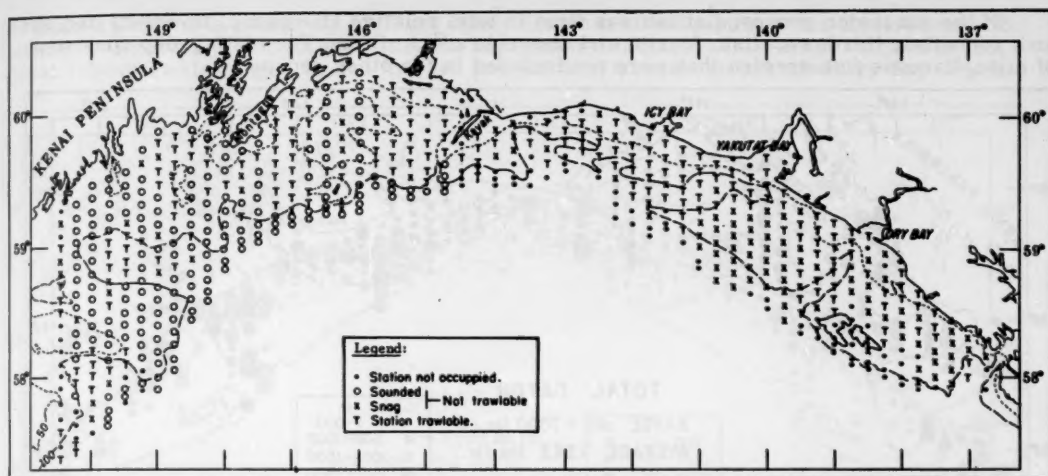


Fig. 6 - Survey area in Gulf of Alaska had 617 stations. Shows distribution of trawlable, not trawlable, and unoccupied stations.

Trawling at depths less than 51 fathoms was restricted because of much hard and uneven bottom. About 80 percent of the successful sampling occurred within the depth range of 51-150 fathoms (table 1). Only 3 percent of the total samples was made in the greatest depths sampled (201-250 fathoms), primarily because the continental slope was steep.

ANALYSIS OF CATCHES: Catches from the successful stations are shown in table 2 by major groups and by depth intervals. The catches of individual groups per unit of trawling effort are shown in table 3. Catches of all species combined in individual hauls ranged from 40 to 7,000 pounds and averaged 1,272 pounds per hour trawled (fig. 7). The most productive area was between Icy Bay and Dry Bay.

Table 1 - Distribution of Sampling Effort for Successful Hauls by Depth Interval

Depth Interval	Hours Fished	Percentage of Effort
Fathoms		%
0-50	27.11	12.4
51-100	104.91	48.0
101-150	69.35	31.7
151-200	11.03	5.0
201-250	6.06	2.8
Total	218.48	99.9

Table 2 - Total Indicated Species Groups Caught by Depth Intervals

Depth Interval	Flatfish	Invertebrates	Roundfish	Rockfish	Elasmobranchs	Other Species	Total
Fathoms							
1-50	16,307	3,670	8,664	13	603	124	29,381
51-100	56,053	26,812	19,137	6,583	4,258	535	113,378
101-150	36,022	29,655	9,979	18,837	2,633	482	97,608
151-200	7,784	13,183	546	2,010	197	58	23,778
201-250	4,547	1,864	2,598	2,489	122	2,185	13,805
Total	120,713	75,184	40,924	29,932	7,813	3,384	277,950
Percentage	43.4	27.0	14.7	10.8	2.8	1.2	99.9

Table 3 - Indicated Species Groups Caught Per Hour Trawled

Depth Interval	Flatfish	Invertebrates	Roundfish	Rockfish	Elasmobranchs	Other Species	Total
Fathoms							
1-50	601.5	135.4	319.6	.5	22.2	4.6	1,083.8
51-100	534.3	255.6	182.4	62.8	40.6	5.1	1,080.7
101-150	519.4	427.6	143.9	271.6	38.0	7.0	1,644.6
151-200	705.7	1,195.2	49.5	182.2	17.9	5.3	2,155.8
201-250	750.3	307.6	428.7	410.7	20.1	360.6	2,278.0
Average	552.5	344.1	187.3	137.0	35.8	15.5	1,272.2

Of the six major groups, flatfish was first in total relative abundance; invertebrates, second; roundfish, third; rockfish, fourth; and elasmobranchs, fifth. The sixth group consisted of miscellaneous fish species that were not included in the other groups.

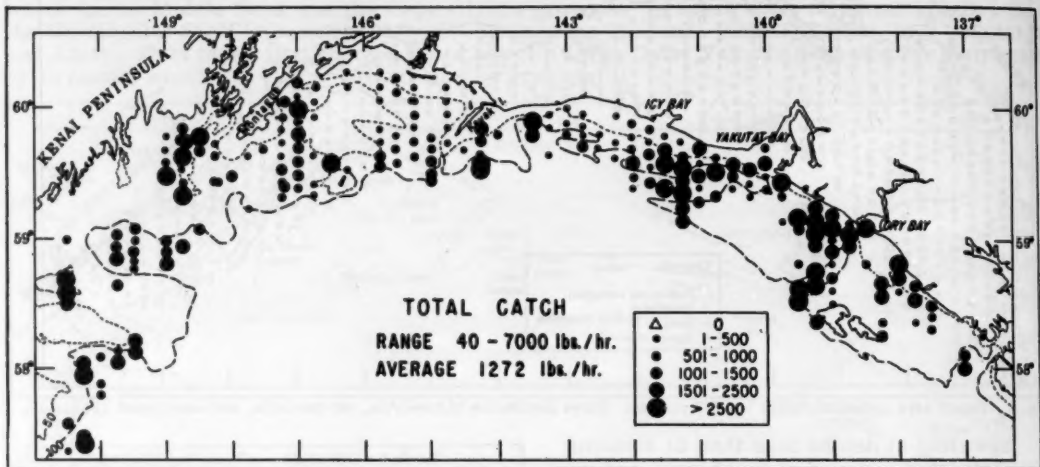


Fig. 7 - Quantity of all species caught per hour trawled.

Flatfish: The flatfish group which comprised 43 percent of the total catch numbered more species than any of the other 4 major fish groups. Species caught were: arrowtooth flounder or turbot, *Atheresthes stomias*; flathead sole, *Hippoglossoides elassodon*; Dover sole, *Microstomus pacificus*; Pacific halibut, *Hippoglossus stenolepis*; butter sole, *Isopsetta isolepis*; rex sole, *Glyptocephalus zachirus*; starry flounder, *Platichthys stellatus*; English sole, *Parophrys vetulus*; rock sole, *Lepidopsetta bilineata*; petrale sole, *Eopsetta jordani*; and sand sole, *Psetichthys melanostictus*.

Table 4 - Total Individual Species of Flatfish Taken by Depth Intervals

Depth Interval	Turbot	Flathead Sole	Dover Sole	Halibut	Butter Sole	Rex Sole	Starry Flounder	English Sole	Rock Sole	Petrale Sole	Sand Sole	Total
Fathoms	(Pounds)											
1-50	3,491	672	6	1,652	5,498	274	3,402	1,010	241	7	53	16,307
51-100	38,447	11,029	694	3,575	167	1,106	143	667	213	12	-	56,053
101-150	24,645	5,425	2,398	1,215	-	2,150	-	1	13	175	-	36,022
151-200	4,264	791	1,491	585	-	653	-	-	-	-	-	7,784
201-250	1,325	-	3,025	50	-	147	-	-	-	-	-	4,547
Total	72,172	17,917	7,614	7,077	5,665	4,330	3,545	1,678	467	194	53	120,713
Percentage	59.8	14.8	6.3	5.9	4.7	3.6	2.9	1.4	0.4	0.1	0.0	100.0

Turbot accounted for about 60 percent of the total flatfish (table 4) and 26 percent of the total catch by weight. The average catch rate (all depth intervals) for that species was 330 pounds per hour trawled; that rate was over four times greater than that for flathead sole, the second most abundant species (table 5). The availability of turbot as measured by the catch

Table 5 - Individual Species of Flatfish Caught Per Hour Trawled

Depth Interval	Turbot	Flathead Sole	Dover Sole	Halibut	Butter Sole	Rex Sole	Starry Flounder	English Sole	Rock Sole	Petrale Sole	Sand Sole	Total
Fathoms	(Pounds)											
1-50	128.8	24.8	0.2	60.9	202.8	10.1	125.5	37.3	8.9	0.3	2.0	601.5
51-100	366.5	105.1	6.6	34.1	1.6	10.5	1.4	6.4	2.0	0.1	-	534.3
101-150	355.4	78.2	34.6	17.5	-	31.0	-	-	0.2	2.5	-	519.4
151-200	386.6	71.7	135.2	53.0	-	59.2	-	-	-	-	-	705.7
201-250	218.6	-	499.2	8.3	-	24.3	-	-	-	-	-	750.3
Average	330.3	82.0	34.9	32.4	25.9	19.8	16.2	7.7	2.1	0.9	0.2	552.5

per hour trawled was relatively high and fairly constant at all depths (table 5); however, that flounder was not the dominant species in all depth intervals (table 14). Turbot catches in individual 1-hour trawls ranged from 0 to 4,500 pounds, with largest catches near Dry Bay (fig. 8).

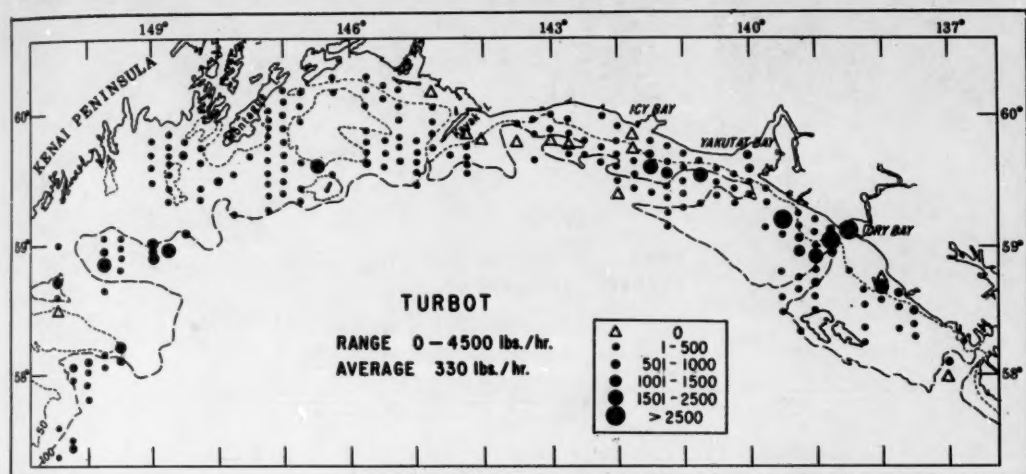


Fig. 8 - Pounds of turbot caught per hour trawled.

Flathead sole ranked second to turbot in the flatfish catches and accounted for about 15 percent of the total flatfish caught (table 4). The catch rate of flathead sole was highest in the 51- to 100-fathom interval (tables 5 and 14). Most of the successful trawls west of Kayak Island contained flathead sole, but to the east many did not. The largest catches of up to 2,250 pounds per hour trawled were between Yakutat Bay and Dry Bay (fig. 9).

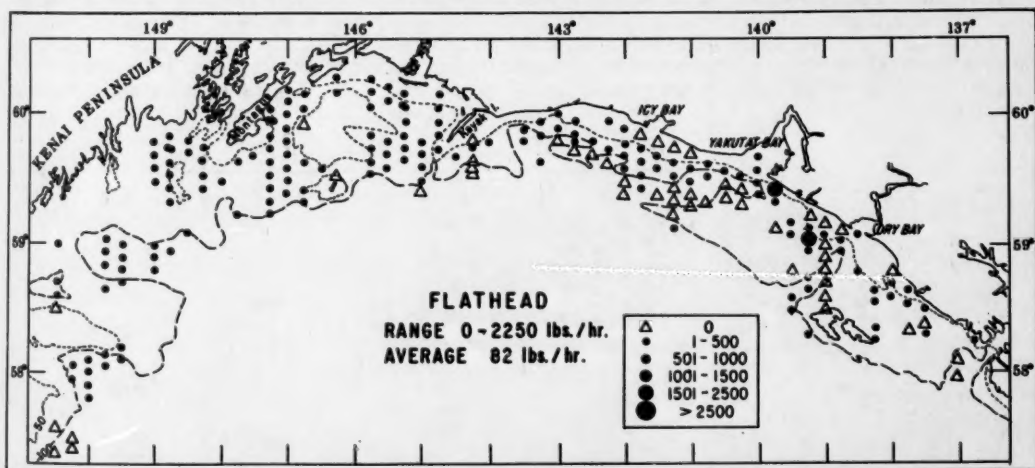


Fig. 9 - Pounds of flathead sole caught per hour trawled.

Dover sole dominated the flatfish catches in the 201-250 fathom interval (tables 4 and 5) and the catch rates in that depth interval were higher than for any other fish species (table 14). Although about 50 percent of the hauls did not contain Dover sole, two 1-hour hauls south of Albatross Gully yielded the largest Dover sole catches--1,000 and 2,000 pounds (fig. 10). Total lengths of Dover sole ranged from 9 to 25 inches and averaged 13.4 inches.

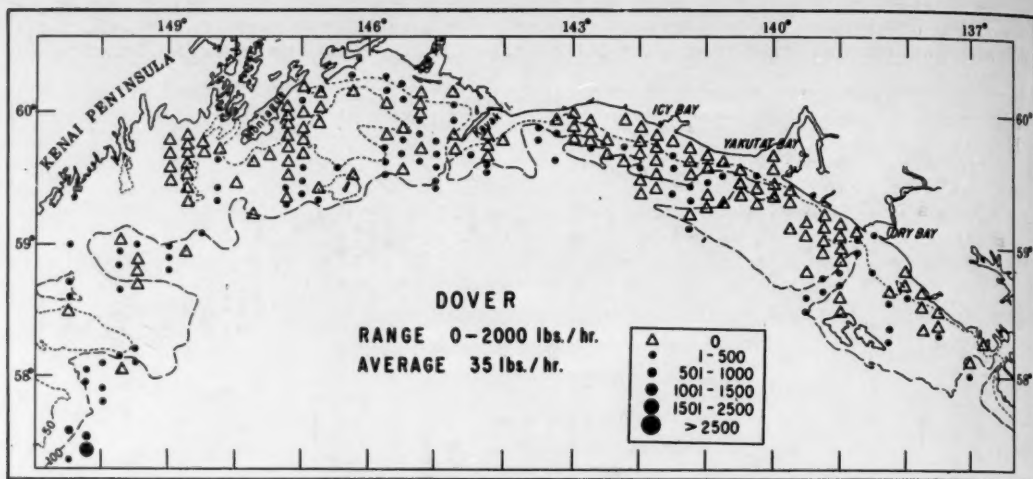


Fig. 10 - Pounds of Dover sole caught per hour trawled.

Butter sole and starry flounder were most abundant in the 1-50 fathom depth intervals where their respective average catch rates were 202 and 125 pounds per hour trawled (tables 5 and 14). In three drags just outside Dry Bay over 1,000 pounds of butter sole were caught per hour trawled. A catch of 1,000 pounds of starry flounders was taken outside of Yakutat Bay.

The remaining six species of flatfish (halibut, rex sole, English sole, rock sole, petrale sole, and sand sole) comprised 11 percent of the total pounds of that species group (table 4). English sole, rock sole, and sand sole were commonly found in the shallower waters (table 5). Halibut and rex sole were found at all depths surveyed (table 5). The highest catch rates for rex sole occurred in the 151-200 fathom depth interval and for halibut in the 1- to 50-fathom interval (table 5). The relative availability of halibut to trawls used in these surveys was fairly uniform throughout the region investigated (fig. 11). The largest catch of halibut was 360 pounds taken in a 1-hour haul off Middleton Island. Total lengths of halibut ranged from 9 to 69 inches and averaged 23.6 inches.

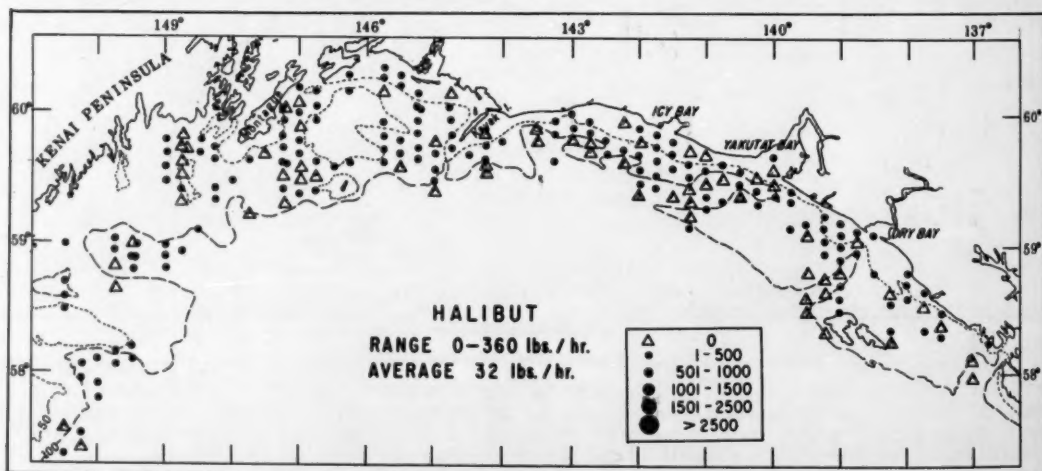


Fig. 11 - Pounds of halibut caught per hour trawled.

Roundfish: The roundfish group (exclusive of rockfish) which comprised 15 percent of the total catch was made up of four species; true cod (*Gadus macrocephalus*), Alaska pollock (*Theragra chalcogrammus*), sablefish (*Anoplopoma fimbria*), and lingcod (*Ophiodon elongatus*).

True cod accounted for about 40 percent of the total roundfish captured (table 6). The availability of true cod was highest in the 1- to 50-fathom interval (table 7) and also higher than any other species caught in that interval (table 14). Catches of true cod were scattered throughout the survey area (fig. 12). The largest catches were taken on Yakutat Flats (1,000 and 6,000 pounds in two 1-hour hauls) and near Blying Banks southwest of Cape Cleare (4,500 pounds in a 1-hour haul). Total lengths of true cod ranged from 11 to 30 inches and averaged 18 inches.

Depth Interval	True Cod	Pollock	Sablefish	Lingcod	Total
Fathoms			(Pounds)		
1-50	8,030	262	364	8	8,664
51-100	7,732	8,816	2,544	45	19,137
101-150	801	6,283	2,889	6	9,979
151-200	8	327	211	-	546
201-250	2	-	2,596	-	2,598
Total	16,573	15,688	8,604	59	40,924
Percentage	40.5	38.3	21.0	0.1	99.9

Depth Interval	True Cod	Pollock	Sablefish	Lingcod	Total
Fathoms			(Pounds)		
1-50	296.2	9.7	13.4	0.3	319.6
51-100	73.7	84.0	24.2	0.4	182.4
101-150	11.6	90.6	41.7	0.1	143.9
151-200	0.7	29.7	19.1	-	49.5
201-250	0.3	-	428.4	-	428.7
Average	75.9	71.8	39.4	0.3	187.3

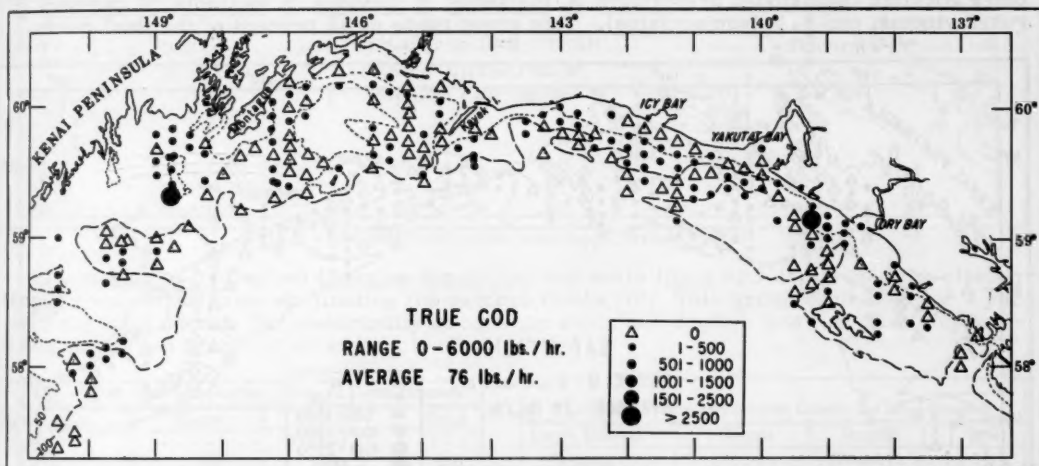


Fig. 12 - Pounds of true cod caught per hour trawled.

The Alaska pollock was most available in the depth range of 51-150 fathoms (tables 7 and 14). About 50 percent of the hauls east and 83 percent of the hauls west of Cape Hinchinbrook contained Alaska pollock (fig. 13). Several catches of over 1,000 pounds per hour trawled were taken west of Cape Hinchinbrook.

The catch rate of sablefish in the 201- to 250-fathom interval was 10 times as high as that obtained in any shallower interval (table 7) and was higher than that for any other species except Dover sole in this deepest interval surveyed (table 14). About 76 percent of the hauls made during the survey contained sablefish. The two largest catches of 1,500 and 2,000 pounds of sablefish per hour trawled of sablefish were taken off Cape Spencer and near the Fairweather Grounds (fig. 14).

Rockfish: For convenience rockfish are divided into four groups: Pacific ocean perch (*Sebastes alutus*), idiots (*Sebastes* sp.), rougheye rockfish (*Sebastes aleutianus*), and

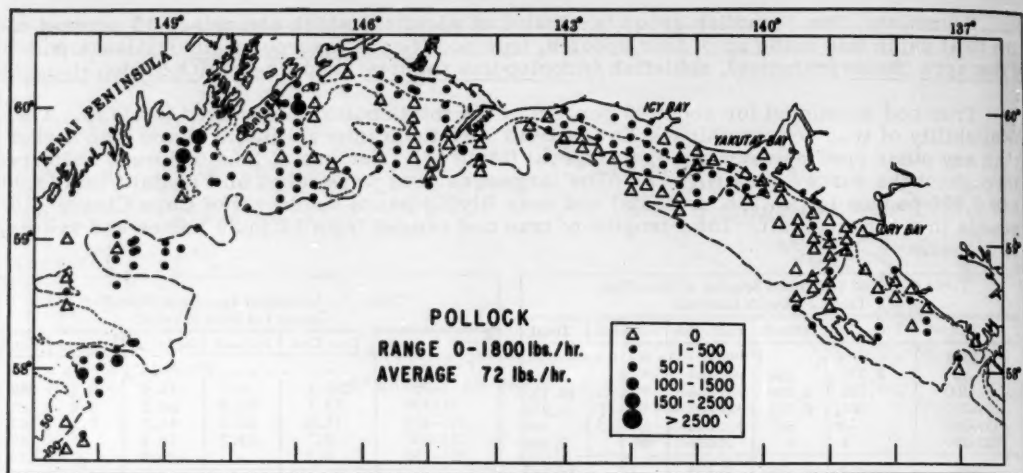


Fig. 13 - Pounds of pollock caught per hour trawled.

other rockfish (*Sebastes brevispinis*, *S. melanops*, *S. flavidus*, *S. saxicola*, *S. crameri*, *S. rubrivinctus*, and *S. halvomaculatus*). This group made up 11 percent of the total catch.

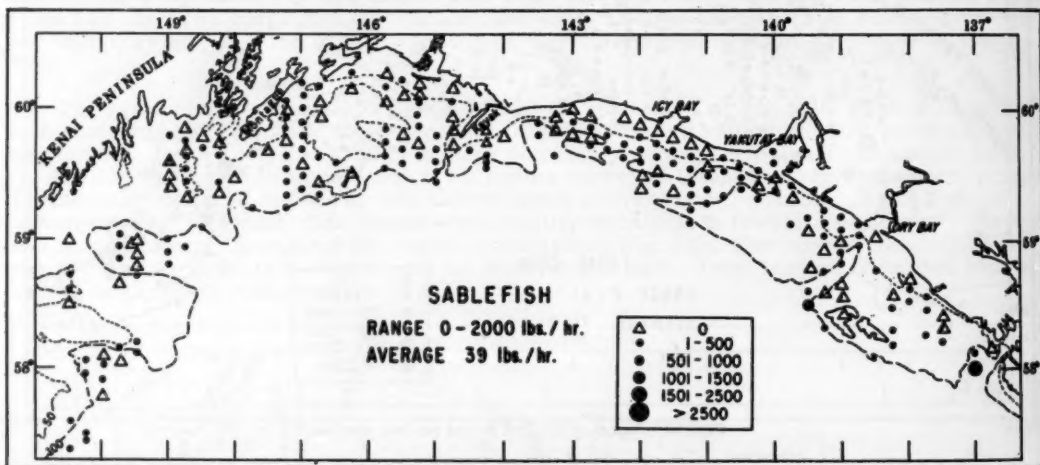
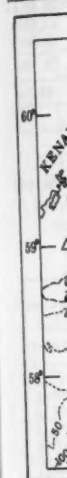


Fig. 14 - Pounds of sablefish caught per hour trawled.

Pacific ocean perch represented 74 percent of the total rockfish catch (table 8). Catch rates of that species were highest in the 101- to 200-fathom depth range (tables 9 and 14). About 63 percent of the hauls made during the survey contained Pacific ocean perch, with the large catches of over 1,000 pounds occurring near the 100-fathom contour (fig. 15).

The remaining three groups of rockfish accounted for 26 percent of the total rockfish catch (table 8). Catch rates of both *Sebastes* and the rougheye rockfish generally increased with depth (table 9). The indicated relative abundance of rougheye rockfish was highest (336 pounds per hour trawled) in the 201- to 250-fathom interval (tables 9 and 14).

Table 8	
Depth Interval	Fathoms
	1-50
	51-100
	101-150
	151-200
	201-250
	Total
	Percentage



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Table 8 - Total Individual Species or Groups of Rockfish Taken by Depth Interval

Depth Interval	Pacific Ocean Perch	Sebastes	Rougheye	Others	Total
Fathoms	(Pounds)				
1-50	2	-	1	10	13
51-100	6,059	243	182	99	6,583
101-150	14,185	3,817	616	219	18,837
151-200	1,748	253	5	4	2,010
201-250	-	451	2,034	4	2,489
Total	21,994	4,764	2,838	336	29,932
Percentage	73.5	15.9	9.5	1.1	100.0

Table 9 - Individual Species or Groups of Rockfish Caught Per Hour Trawled

Depth Interval	Pacific Ocean Perch	Sebastes	Rougheye	Others	Total
Fathoms	(Pounds)				
1-50	0.1	-	0.0	0.4	0.5
51-100	57.8	2.3	1.7	0.9	62.8
101-150	204.5	55.0	8.9	3.2	271.6
151-200	158.5	22.9	0.5	0.4	182.2
201-250	-	74.4	335.6	0.7	410.7
Average	100.7	21.8	13.0	1.5	137.0

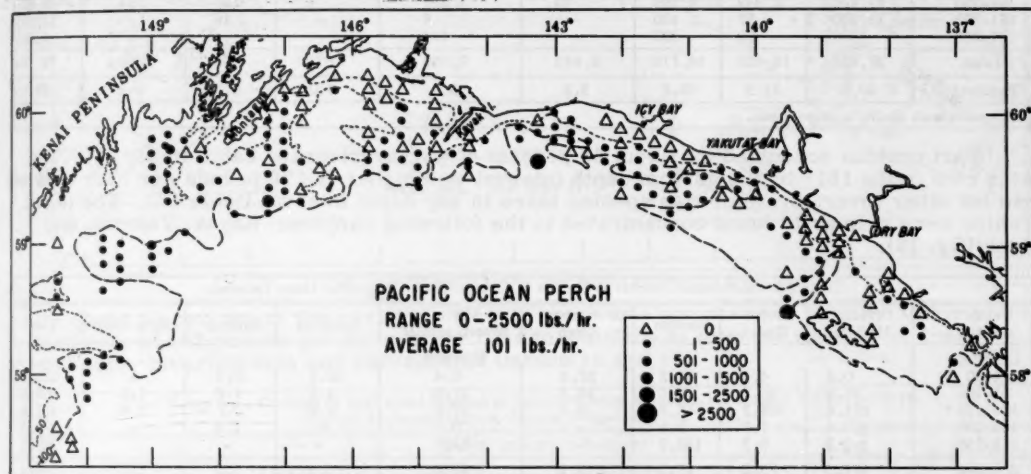


Fig. 15 - Pounds of Pacific ocean perch caught per hour trawled.

Elasmobranchs: Dogfish (*Squalus acanthias*) and skate (*Raja* sp.) comprised the elasmobranch group, with skates dominating the catches (table 10). This group accounted for 3 percent of the total catch. The availability of both the skate and dogfish was low in all depth intervals compared to that of other species (table 14).

Table 10 - Total Skate and Dogfish Taken by Depth Interval

Depth Interval	Skates	Dogfish	Total
Fathoms	(Pounds)		
1-50	362	241	603
51-100	3,274	984	4,258
101-150	2,506	127	2,633
151-200	197	-	197
201-250	122	-	122
Total	6,461	1,352	7,813
Percentage	82.7	17.3	100.0

Table 11 - Skate and Dogfish Caught Per Hour Trawled

Depth Interval	Skates	Dogfish	Total
Fathoms	(Pounds)		
1-50	13.4	8.9	22.2
51-100	31.2	9.4	40.6
101-150	36.1	1.8	38.0
151-200	17.9	-	17.9
201-250	20.1	-	20.1
Average	29.6	6.2	35.8

Other Fish Species: This group consists of many different families including herring (Clupeidae), sculpin (Cottidae), poacher (Agonidae), ronquil (Bathymasteridae), eelpout (Zoarcidae), and rattail (Coryphaenoididae). This group accounted for only one percent of the total catch. Most of the catches in this group were insignificant except in the 201- to 250-fathom interval where a value of 360 pounds per hour trawled was attained (table 3), over 99 percent of which consisted of rattail. This rate was higher than that of any other single species taken at that depth, except Dover sole and sablefish (table 14). Total lengths of the rattail ranged from 29 to 38 inches and averaged 23.9 inches in total length.

Invertebrates: Invertebrates comprising 27 percent of the total catch were grouped into eight categories; heart urchins (Echinoidea), tanner crab (*Chionoecetes opilio*), starfish (Asteroidea), Dungeness crab (*Cancer magister*), scallop (*Pecten caurinus*), shrimp (*Pandalus borealis*, *P. platyceros*, and *Pandalopsis dispar*), king crab (*Paralithodes camtschatica*), and miscellaneous invertebrates (shells, sponges, etc.)

Table 12 - Total Individual Species or Groups of Invertebrates by Depth Intervals

Depth Interval	Heart Urchins	Tanner Crab	Starfish	Dungeness Crab	Misc. Invert. spp. 1/	Scallops	Shrimp	King Crab	Total
Fathoms					(Pounds)				
1-50	10	125	2,201	1,025	12	286	11	-	3,670
51-100	6,047	8,862	8,224	1,606	1,256	472	191	154	26,812
101-150	17,465	7,333	3,385	10	1,220	2	186	54	29,655
151-200	13,100	57	100	-	8	-	18	-	13,183
201-250	900	50	800	-	114	-	-	-	1,864
Total	37,422	16,427	14,710	2,641	2,610	760	406	208	75,184
Percentage	49.8	21.9	19.6	3.5	3.4	1.0	0.5	0.3	99.99

1/Miscellaneous shells, sponges, etc.

Heart urchins accounted for about 50 percent of the invertebrate catch (table 12). The catch rate in the 151- to 200-fathom depth interval was higher (1,179 pounds per hour trawled) than for other invertebrate or fish species taken in any depth interval (table 14). The heart urchins were primarily found concentrated in the following canyons: Kayak, Yakutat, and Alesek (fig. 16).

Table 13 - Individual Species or Groups of Invertebrates Caught Per Hour Trawled

Depth Interval	Heart Urchins	Tanner Crab	Starfish	Dungeness Crab	Misc. Invert. spp. 1/	Scallops	Shrimp	King Crab	Total
Fathoms					(Pounds)				
1-50	0.4	4.6	81.2	37.8	0.4	10.6	0.4	-	135.4
51-100	57.6	84.5	78.4	15.3	12.0	4.5	1.8	1.5	255.6
101-150	251.8	105.7	48.8	0.1	17.6	0.0	2.7	0.8	427.6
151-200	1,178.6	5.2	9.1	-	0.7	-	1.6	-	1,195.2
201-250	148.5	8.2	132.0	-	18.8	-	-	-	307.6
Average	171.3	75.2	67.3	12.1	12.0	3.5	1.9	1.0	344.1

1/Miscellaneous shells, sponges, etc.

Tanner crab ranked second to heart urchins and represented about 22 percent of the invertebrate catch (table 12). The catch rate of tanner crab was highest in the 101- to 150-

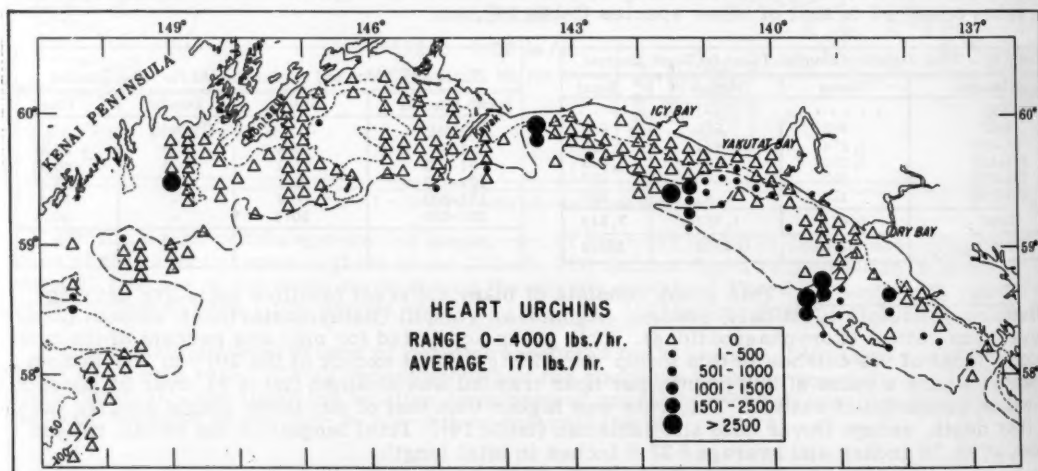


Fig. 16 - Pounds of heart urchins caught per hour trawled.

fathom interval (tables 13 and 14). Eighty-five percent of the catches west and 50 percent of the catches east of Middleton Island had tanner crab. The largest catch of 2,390 pounds per hour trawled occurred northwest of Middleton Island (fig. 17).

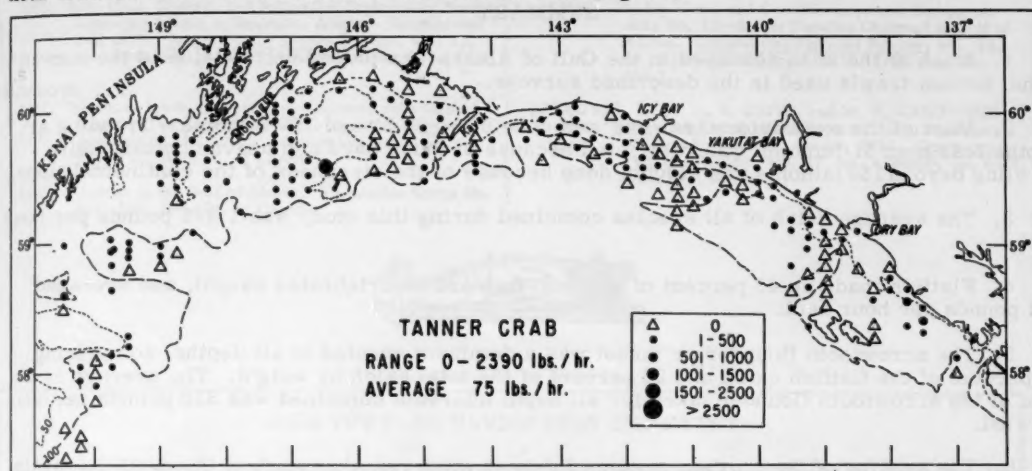


Fig. 17 - Pounds of tanner crab caught per hour trawled.

About 20 percent of the total invertebrate catch was composed of starfish (table 6). The catch rate of 132 pounds per hour in the 201- to 250-fathom interval was higher than that for most other invertebrates and fish species (tables 13 and 14).

Table 14 - Ranking of Individual Species or Species Groups by Catch Per Unit of Effort and Depth
(Figures in Parenthesis are Pounds Caught Per Hour Trawled)

Depth Interval in Fathoms					
1-50	51-100	101-150	151-200	201-250	All Depths (1-250)
True cod (296)	Turbot (366)	Turbot (355)	Heart urchin (1179)	Dover (499)	Turbot (330)
Butter sole (203)	Flathead (105)	Heart urchins (252)	Turbot (386)	Sablefish (428)	Heart urchins (171)
Turbot (129)	Tanner crab (84)	P.O.P. (204)	P.O.P. (158)	Other fish sp. (361)	P.O.P. (101)
Starry flounder (125)	Pollock (84)	Tanner crab (106)	Dover (135)	Rougheye (336)	Flathead (82)
Starfish (81)	Starfish (78)	Pollock (91)	Flathead (72)	Turbot (218)	True cod (76)
Halibut (61)	True cod (74)	Flathead (78)	Rex (59)	Heart urchins (148)	Tanner crab (76)
Dungeness (38)	P.O.P. (58)	Sebastolobus (55)	Halibut (53)	Starfish (132)	Pollock (72)
English (37)	Heart urchins (58)	Starfish (49)	Pollock (30)	Sebastolobus (74)	Starfish (67)
Flathead (25)	Halibut (34)	Sablefish (42)	Sebastolobus (23)	Rex (24)	Sablefish (39)
Sablefish (13)	Skate (31)	Skate (36)	Sablefish (19)	Skate (20)	Dover sole (35)
Skate (13)	Sablefish (24)	Dover (35)	Skate (18)	Misc. inver. (19)	Halibut (32)
Scallop (10)	Dungeness (15)	Rex (31)	Starfish (9)	Halibut (8)	Skate (29)
Rex (10)	Misc. inver. (12)	Misc. inver. (18)	Tanner crab (5)	Tanner crab (8)	Butter sole (26)
Pollock (10)	Rex (11)	Halibut (17)	Other fish sp. (5)	Other rockfish (1)	Sebastolobus (22)
Rock sole (9)	Dogfish (9)	True cod (12)	Shrimp (2)	True cod (0.3)	Rex sole (20)
Dogfish (9)	Dover (7)	Rougheye (9)	Misc. inver. (1)	Dogfish (0)	Starry flounder (16)
Tanner crab (5)	English (6)	Other fish sp. (5)	True cod (1)	P.O.P. (0)	Other fish sp. (5)
Other fish sp. (5)	Other fish sp. (5)	Other rockfish (3)	Rougheye (0.5)	Lingcod (0)	Rougheye (13)
Misc. inver. (0.4)	Scallop (4)	Shrimp (3)	Other rockfish (0.1)	Pollock (0)	Dungeness (12)
Shrimp (0.4)	Sebastolobus (2)	King crab (3)	Rock sole (0)	Shrimp (0)	Misc. inver. (12)
Heart urchins (0.4)	Rock sole (2)	Petrale (2)	Petrale (0)	King crab (0)	English sole (8)
Other rockfish (0.4)	Shrimp (2)	Dogfish (2)	English (0)	Dungeness (0)	Dogfish (6)
Lingcod (0.3)	Rougheye (2)	Rock sole (0.2)	Butter sole (0)	Scallop (0)	Scallop (3)
Petrale (0.3)	Butter sole (2)	Dungeness (0.1)	Starry flounder (0)	Rock sole (0)	Rock sole (2)
Sand sole (0.2)	King crab (1)	Lingcod (0.1)	Sand sole (0)	Petrale (0)	Shrimp (2)
Dover (0.2)	Starry flounder (1)	Scallop (0)	King crab (0)	Flathead (0)	Other rockfish (2)
P.O.P. (0.1)	Other rockfish (1)	English (0)	Dungeness (0)	English (0)	King crab (1)
Rougheye (0.1)	Lingcod (0.4)	Butter sole (0)	Scallop (0)	Butter sole (0)	Petrale (1)
King crab (0)	Petrale (0.1)	Starry flounder (0)	Lingcod (0)	Starry flounder (0)	Lingcod (0.3)
Sebastolobus (0)	Sand sole (0)	Sand sole (0)	Dogfish (0)	Sand sole (0)	Sand sole (0.2)

The remainder of the invertebrate catches consisted of Dungeness crab, scallop, shrimp, king crab, and miscellaneous species (table 12). Dungeness crab and scallop were primarily

found in shallow water (table 13). Catches of both those species were small with the exception of a 1,000-pound haul of scallop taken just east of Cape St. Elias.

SUMMARY

1. Much of the area surveyed in the Gulf of Alaska was judged untrawlable to the conventional bottom trawls used in the described surveys.

2. Most of the exploratory trawling was done between 51 and 150 fathoms. Trawling at depths less than 51 fathoms was restricted because of much hard and uneven bottom while trawling beyond 150 fathoms was seldom done because of the steepness of the continental slope.

3. The average catch of all species combined during this study was 1,272 pounds per hour haul.

4. Flatfish made up 43 percent of the total fish and invertebrates caught, and averaged 552 pounds per hour haul.

5. The arrowtooth flounder or turbot was a dominant species at all depths, comprising 60 percent of the flatfish catch and 26 percent of the total catch by weight. The average catch rate of the arrowtooth flounder taken for all depth intervals combined was 330 pounds per hour trawled.

6. The ranking of the top four species (highest catch rates) in each of the depth intervals was: 0-50 fathoms--true cod, Bellingham sole, turbot, and starry flounder; 51-100 fathoms--turbot, flathead sole, tanner crab and pollock; 101-150--turbot, heart urchins, Pacific ocean perch, and tanner crab; 151-200 fathoms--heart urchins, turbot, Pacific ocean perch, and Dover sole; 201-250--Dover sole, sablefish, rougheye rockfish, and miscellaneous species.

FISHING LOG

A detailed fishing log showing the fishing positions, time on bottom, catch particulars, and other pertinent data for each drag is available by writing the Seattle office¹ for the John N. Cobb's Cruise Nos. 52 and 54 and the Juneau office² for the Tordenskjold Cruise No. 2.

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ARE TURTLES NAVIGATION EXPERTS?

How can green sea turtles find their way across more than 1,000 miles of open sea to tiny Ascension Island in the South Atlantic? That is one of the intriguing questions posed by the theory that Brazilian green sea turtles travel to Ascension Island to nest. A tagging project that may throw more light on the mystery was discussed by a University of Florida herpetologist in *Bioscience*, Vol. 14, No. 8.

In 1960 on Ascension Island beaches, a total of 206 turtles were tagged before they returned to the sea. (Turtles completely disappear from Ascension waters by June of each year.) By 1964, eight of the tagged turtles had been recovered along the coast of Brazil. The recoveries came from both north and south of the Brazilian Bulge, at sites located "downstream" from both the Equatorial and the Brazilian ocean currents. (No returns came from the West African coast east of Ascension Island.)

Meanwhile, observers on Ascension Island checked nesting turtles for tag returns. Green sea turtles reproduce in accordance with two different rhythms. About 70 percent follow the major 3-year reproductive rhythm, and the remaining 30 percent reproduce on the minor 2-year rhythm. Possible recovery on Ascension beaches of the 1960-tagged turtles was first tested by means of a tag-check patrol at three beaches in 1963 to catch survivors of the major rhythm group. Three tags were recovered at the identical beaches where the turtles were tagged. In 1964, a similar check was made for possible survivors of the minor rhythm group, making their second round trip since tagging 4 years earlier. As a result, two more tags were recovered at or near the original tagging beach.

These two-way tag returns tend to confirm the theory that green sea turtles found off Brazil nest on Ascension Island. (It is known that the mature female turtles that occur along the Brazilian coast do not nest in Brazil.) The turtles could probably travel from the middle Atlantic to Brazil merely by drifting with ocean currents. But the largest question remains--how after spending 2 or 3 years in Brazil do the turtles find their way back to the 5-mile rock that is Ascension Island through more than 1,000 miles of open sea?

The University of Florida scientist suggests that this remarkable feat may be accomplished by some sort of bi-coordinate navigation. Compass-sense alone would not be enough to keep the turtles on course. The scientist said the solution to this puzzle would depend at least partly upon the precise plotting of actual travel courses of individual turtles. (*SFI Bulletin*, No. 159, February 1965.)

TRENDS AND DEVELOPMENTS

Alaska

SOVIET AND JAPANESE KING CRAB VESSELS VISITED BY U. S. BIOLOGISTS:

Following agreements made with the Soviet Union and Japan late in 1964, United States biologists boarded Soviet and Japanese king crab vessels in the Bering Sea in June 1965 as observers. Two American biologists were on the Soviet factoryship *Aleksandr Obukhov* for two weeks until June 30. Another American biologist observer was aboard the Japanese factoryship *Tainichi Maru*. Tanner crabs were being processed on the Soviet vessel. All parts of the crabs were kept, with the inedible parts saved for poultry food.

FOREIGN FISHING ACTIVITY OFF ALASKA, JUNE 1965:

U. S. S. R.: The Gulf of Alaska continued to be the center of Soviet trawling efforts during June. In the eastern Gulf from Cape St. Elias to Dixon Entrance, the size of the fleets declined from about 40 vessels in early June to about 10 by month's end. A small contingent of 1 reefer and 3 trawlers broke away from the Gulf of Alaska fleets about the first of June and spent several weeks off the Washington-British Columbia coasts. Catches of ocean perch from the more southern waters were apparently not too productive as that small fleet returned to the area off southeast Alaska in late June.



Fig. 1 - Soviet factoryship in Bering Sea.

A slight reduction in the size of the trawling fleets in the central Gulf became evident by the end of June presumably indicating the transfer of vessels to the herring and saury fisheries off the Soviet coasts, which began about late June in previous years. Portlock Bank east of Kodiak was the area most intensively fished by the Soviets, supporting over 100 vessels early in June and declining to about 70 at month's end. Larger numbers of trawlers began operating on Portlock Bank southwest of Kodiak about mid-month and totaled over 30 vessels by the end of June.



Fig. 2 - New Soviet-type trawler (SRT-M) in foreground fishing for shrimp in Bering Sea. Japanese vessel in background.

In early June a Soviet fleet began building near Segum Pass in the central Aleutians, which quickly developed into a major fishing effort. The fleet was composed of about 25 trawlers, including at least 12 BMRT factory trawlers, a few reefers, and various support vessels.

Another fleet of about 10 to 15 trawlers, including several factory trawlers, ranged along the western Aleutians throughout June.

Except for the brief time the Soviet factoryship *Konstantin Subhanov* spent in the western Gulf of Alaska, the 3 king crab fleets remained throughout June in the outer Bristol Bay "flats" northwest of Port Moller.

There were no new sightings in June of the Soviet trawlers previously engaged in the shrimp fishery, but it was believed at least 4 SRT-M type trawlers were shrimp fishing east of the Shumagin Islands.

In June, apparently only one Soviet whaling fleet was active in the Alaskan area. That was the Aleut fleet which was believed to have been active primarily in the western Aleutians.

Japan: The factoryship Chichibu Maru and her 12 trawlers continued during June to fish for ocean perch and flatfish in the central and western Aleutians.

The 4 Japanese factory trawlers and 4 smaller side trawlers which were operating in the western Aleutians were not seen in June and had presumably left the Alaska area. Two other factory trawlers were believed working generally along the 100-fathom curve between the eastern Aleutians and the Pribilof Islands.

The Japanese announced on June 1 that 11 trawling fleets made up of 9 factory trawlers and 14 smaller side trawlers were to be licensed to operate in the Gulf of Alaska this year (1965). This is nearly 4 times the trawling effort the Japanese placed in the Gulf in 1964. By the end of June, 2 of the factory trawlers and a side trawler were working south of Unalaska Island west of Unimak Pass, and in the Gulf of Alaska 2 factory trawlers and 4 side trawlers were active on Albatross Bank south of Kodiak Island.



Fig. 3 - Repairing crab baskets aboard a Japanese crab factoryship.

About mid-June the 3 Japanese fish meal and oil fleets totaling 65 trawlers were no longer operating on the edge of Bristol Bay shelf northeast of Unimak Pass. Those fleets may have followed the pattern of past years and shifted their operational areas to the area northwest of the Pribilof Islands.

The Japanese factoryship Einen Maru and her 15 trawlers continued to operate 40 to 100 miles north of the Pribilof Islands throughout the month in the shrimp fishery.



Fig. 4 - Trawler fishing for Japanese crab factoryship Tokei Maru.

In late May 1965 the Tokei Maru fleet shifted from the accustomed crab grounds off Port Moller to just east of the Pribilof Islands--an area not previously fished intensively by the Japanese king crab fleets. Japanese personnel of that fleet said that the presence of Soviet crab fleets near Port Moller was a significant factor in their decision to move to the Pribilof region. The Tokei Maru fleet operated just east of the Pribilofs throughout June.



Fig. 5 - Hoisting gear in bow of Japanese trawler fishing for factoryship.

The second king crab fleet of the Tainichi Maru remained in the area off Port Miller most of the month, shifting southwest to near Amak Island in late June.

The small Japanese long-line fishing fleet operating in the western Aleutians during May apparently left the Alaska area by early June. Japanese long-line fishing efforts off Alaska had been negligible so far this year, and as far as is known they have not had a long-line fishery for halibut off Alaska in 1965.

Japanese salmon fleets moved just west of the International North Pacific Fisheries Convention (INPFC) salmon abstention line the first days of June but by mid-June after one of their gill-netters was apprehended in violation they had withdrawn to the westward. Intensified United States surveillance patrols in the central Aleutians were terminated on June 18. By that time, the bulk of the maturing Bristol Bay-destined salmon were believed east of the critical corridor between 175° W. to 175° E. and 52° N. to 55° N. The Japanese fleets did not reappear in the corridor during June.

This year the Japanese again sent three whaling fleets to the area off Alaska. A fleet composed of 1 factoryship and 7 whale killers began whaling in the central Aleutians about mid-June and remained in that area for the rest of the month. The other 2 fleets of identical vessel composition were not seen during June but at least one of them was believed working in the Gulf of Alaska.

NEW FISHING INDUSTRY FOR UNALAKLEET:

A \$42,000 loan for the construction of a new fish-processing and storage facility in Unalakleet has been approved by the Small Business Administration.

1965 HARVEST KELP AND HERRING ROE:

The southeastern Alaska herring roe industry harvested 467,000 pounds of roe-laden kelp during the 1965 season, a 27-percent increase over the 1964 harvest of 369,000 pounds. The harvest was made in the Craig, Hydagberg, and Sitka areas. A total of 765 persons, working mostly from skiffs, used grapples to pull the heavily laden kelp to the surface, where the fronds with the desirable thickness of roe were picked.

In the Craig and Hydagberg areas spawning occurred over an estimated 20 lineal miles

of beach. The relatively small amount of kelp and herring roe being utilized is reflected in the fact that the harvest in that area took place entirely within a 1-mile area. The proportion was the same for the Sitka area.



Alaska Fisheries Explorations and Gear Development

BOTTOMFISH RESOURCES OFF SOUTHEAST ALASKA STUDIED:

M/V "John R. Manning" Cruise 65-1 (April 29-May 15 and May 20-June 7, 1965): To locate trawlable fishing grounds and to delineate commercial concentrations of bottomfish off southeast Alaska was the primary objective of this 6-week cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John R. Manning. Secondary objectives were to: (1) collect data on the seasonal distribution and abundance of the bottomfish resources of Southeastern Alaska, and (2) collect preliminary data on the biological and environmental factors affecting their distribution and abundance.



Fig. 1 - M/V John R. Manning of the U.S. Bureau of Commercial Fisheries.

Echo-sounding transects were made to locate trawlable fishing grounds, and areas which appeared to be reasonably level and of soft consistency were fished with a standard 400-mesh Eastern otter trawl. For the most part, sounding effort was concentrated on the Continental Shelf between Coronation and Noyes Islands. Limited sounding transects were also made in the Gulf of Esquibel.

A total of 32 drags lasting about 1-hour each was made in depths from 32 to 138 fathoms. In the shoal area off Noyes Island, catches of 100-130 pounds of marketable rock sole (Lepidopsetta bilineata) were made

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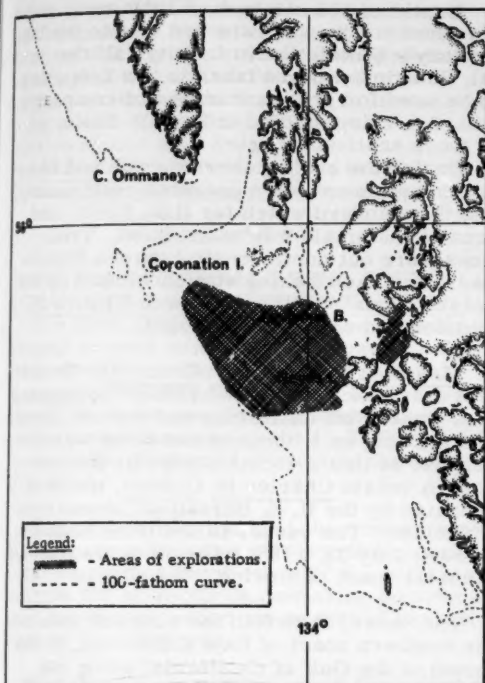


Fig. 2 - M/V John R. Manning bottomfish exploratory cruise 65-1 (April 29-May 15 and May 20-June 7, 1965).

in 4 drags. Those drags ranged in depth from 45 to 64 fathoms. In one of the drags, 1,600 pounds of 100-percent marketable grey cod (*Gadus macrocephalus*) were taken.

In the deeper offshore areas, rockfish accounted for a large percentage of the catch. The largest rockfish catch of the cruise (23,500 pounds) was taken in a drag made in 117 fathoms, 35 miles southwest of Noyes Island. That catch was made up of 20,000 pounds of silver-grey rockfish (*Sebastes brevispinis*), 3,000 pounds of widow rockfish (*Sebastes entomelas*), and 490 pounds of assorted rockfish. In two other drags, 375 pounds of silver-grey rockfish were taken in 102 fathoms and 250 pounds of Pacific ocean perch (*Sebastes alutus*) were taken in 138 fathoms.

The 23,500-pound rockfish catch was delivered to the U. S. Department of Agriculture Experimental Fur Farm, Petersburg, Alaska, for use as mink feed.

Note: See *Commercial Fisheries Review*, August 1965 p. 24.

SHRIMP AND BOTTOMFISH RESOURCES OFF SOUTHEAST ALASKA TO BE STUDIED:

M/V "Commando" Cruise 65-2 (July 7-August 25, 1965): To locate trawlable fishing grounds and delineate commercial concentrations of shrimp and bottomfish off southeast Alaska was the principal objective of this cruise by the exploratory fishing vessel *Commando*, chartered by the U. S. Bureau of Commercial Fisheries.

Secondary objectives were to: (1) collect data on the seasonal distribution and abundance of shrimp and bottomfish resources of southeastern Alaska, and (2) collect preliminary data on the ability of the 400-mesh eastern otter trawl to fish on rough bottom when equipped with a roller gear.

Shrimp explorations (from 40 to 110 fathoms) and bottomfish explorations (from 10 to 200 fathoms) were to be conducted on the Continental Shelf and Slope of southeastern Alaska from Dixon Entrance to Cape Ommaney.

Methods of operation during the cruise were to include making echo-sounding transects to locate trawlable fishing grounds. The grounds were then to be sampled with a 40-foot Gulf of Mexico-type shrimp trawl or the 400-mesh Eastern otter trawl.



Alaska Fisheries Investigations

KARLUK SALMON MIGRATIONS DELAYED:

Probably due to the recent severe winter, the migrations of Karluk Lake red salmon were late for all stages. This includes movements of fry into Karluk Lake, departure of smolts for the ocean, and arrival of adults from salt water. In southeastern Alaska, the movements and growth of pink and chum fry in salt water have been much different than in 1964, probably due to the cold winter and spring. In the northern part of southeast Alaska the pink juveniles were less abundant and smaller.

RECORD NAKNEK RED SALMON SMOLT RUN SHOWS CHANGES IN PATTERN:

Over 23 million smolts went downstream in the Naknek system--the highest migration

since records were started in 1956. The previous high was in 1962 when 16.5 million were estimated. Extreme windstorms produced unusually turbid water in the Naknek River which caused a reversal of the normal night migration pattern, and this past spring most of the smolts migrated during the daytime. The 1965 smolt migration was about evenly divided between 2 and 3 years of freshwater residence.



Cans--Shipments for Fishery Products

January-April 1965: A total of 898,911 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-April 1965 as compared with 841,363 base boxes used during the same period in 1964.

January-May 1965: A total of 1,177,997 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-May 1965 as compared with 1,100,728 base boxes used during the same period in 1964. It is believed that larger shipments to the Pacific or Western Area (principally for salmon and tuna) accounted for the small increase in 1965.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 23.7 base boxes per short ton of steel.



Central Pacific Fisheries Investigations

SKIPJACK TUNA

BIOLOGICAL STUDIES CONTINUED:

M/V "Charles H. Gilbert" Cruise 82 (May 24-30, 1965): The area of operations during this cruise by the research vessel Charles H. Gilbert of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, was south of Oahu between Kewalo Basin and Browns Camp about 15 miles from shore. Objectives were to: (1) collect and return live mackerel-like species to the Bureau's laboratory behavior tank facilities; (2) collect tuna specimens for density determinations; and (3) determine the weight lost from small, medium, and large skipjack tuna after removal of head and viscera.

A total of 184 skipjack, 3 little tuna, and 2 yellowfin tuna was returned live to the laboratory's Kewalo Basin facility. Of that total, 20 skipjack were taken to Sea Life Park to be used for growth studies and compared with fish being studied at Kewalo Basin.

During the cruise, thermograph and barograph equipment were operated continuously, and the standard watch for fish, birds, and aquatic mammals was maintained. Troll lines were out continuously between Kewalo Basin and each fishing station worked by the vessel. Total trolling time was 9 hours 20 minutes and nothing was caught.

M/V Charles H. Gilbert Cruise 85: To collect data which may show whether the skipjack tuna fishery off California and that off Hawaii are drawing on a common resource was the purpose of this 2-month cruise by the research vessel Charles H. Gilbert, which is operated by the U. S. Bureau of Commercial Fisheries. The vessel sailed from Honolulu, Hawaii, July 23, 1965, to begin operations off the west coast of Mexico.

The vessel is to fish for skipjack tuna off the southern coast of Baja California, in the mouth of the Gulf of California, along the Mexican mainland south to Manzanillo, and near the Revillagigedo Islands, 500 miles offshore from Mexico. The area is one in which the California-based tuna fleet makes large skipjack catches.

Object of the cruise is to collect blood and serum samples from skipjack. Samples will be taken off Mexico and from any skipjack that may be encountered in the convergence zone above latitude 10° N., which the vessel will traverse on the way home.

Such blood and serum samples will help provide information on whether the large California fishery and that in Hawaii are drawing on a common resource (that is, whether the skipjack are part of one subpopulation). The California fishery takes about 10 times, by weight, as much skipjack annually as does the Hawaiian fleet.

There already is some evidence that the two fisheries share a common resource, but to what degree is a matter of speculation. The blood and serum samples will be used to distinguish subpopulations of the skipjack. (Subpopulations are groups that are reproductively isolated from other groups of their kind.) Using blood-type techniques developed

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for use with humans and domestic animals and adapted for use with tuna, it has been learned that there are several subpopulations of skipjack tuna in the Pacific. Comparison of the subpopulations observed in Hawaiian waters with those sampled in the waters off Mexico should help answer questions about the biological relationship of the two fisheries.

Note: See Commercial Fisheries Review, August 1965 p. 28.

FIRST PHASE OF TRADE WIND ZONE OCEANOGRAPHIC STUDY COMPLETED:

The first phase of an extensive oceanographic project came to an end early in July 1965 when the research vessel Townsend Cromwell returned to her home port of Honolulu, Hawaii, to complete the 16th in a series of cruises undertaken by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu.

The project is a study of the oceanography of the trade wind zone, a region that reaches from longitude 130° W. to 180° E., and from latitude 10° N. to 30° N., covering an area about one and one-third times that of the continental United States.

Working alone, the Townsend Cromwell has been able to investigate only the narrow portion of that region lying north, east, and south of the Hawaiian Islands, an area about twice the size of the State of Texas.

The object of the investigation is to study the seasonal and longer term changes in the distribution of properties in the sea. Those changes are to be examined in terms of the changes in annually repeating processes such as the heat exchange across the sea surface, evaporation minus precipitation, advection, and diffusion. Required for the study are data giving the rate of change as well as the distribution of the properties with time. To find that, sampling has been done at regular, frequent intervals.

The first phase of the investigation is to be followed by a project starting in 1967 in which several vessels will conduct similar investigations over the entire trade wind zone of the North Pacific. The work will last 18 months to 2 years.

The first data from the cruises have been processed and are scheduled to be published as soon as possible. They will be followed up

by a series of descriptive and analytical reports in 1966 and 1967.

In the course of the first phase of the study, the Townsend Cromwell has spent 20 days at sea each month since February 1964, except for August 1964. The vessel has sailed more than 32,000 miles. The pattern for scientific observations during the cruises was established early in the series and did not vary significantly for more than a year. The unchanging routine, in fact, is the heart of the study, since the object is to document month-to-month changes in oceanographic properties in the area. The ultimate aim is to understand the relation of winds and weather to the changes in ocean properties at the surface and to a depth of more than a quarter of a mile, particularly as they affect the commercial fisheries.

The Honolulu Laboratory scientists are finding that the oceanography of the Hawaiian area is complex. Within a depth of a few hundred feet there may be as many as 4 water types which retain their individuality and move with apparent independence of each other.

This finding may have important implications for fisheries, for the depths include those in which commercial fish are caught. This would mean that a fisherman fishing at the surface at a particular location might in 2 months be making his catch in subsurface waters differing in their own ways as sharply as the climates of New Guinea and the Sahara desert and containing different kinds or quantities of fish.

The properties being studied are the temperature of the water, salinity, and the amount of oxygen and phosphorus. All vary according to local influences, but more important according to the past history of the water types.

The pattern for the investigations has included 43 oceanographic stations 90 miles apart. Samples were obtained at 20 depths to about 4,500 feet. Since July 1964, casts to about 12,000 feet were made on three stations. Bathythermographs, which record temperature in the upper layers of the ocean, were taken at 30-mile intervals along the cruise tracks, except at 3 locations on each cruise, where they were taken at 10-mile intervals. In addition, meteorological observations were made, and the radiation from sun and sky recorded.

M/V "Townsend Cromwell" Cruise 16 (May 12-31, 1965): The flow pattern south of 20° N. continued to be setting slightly northwesterly as in the previous month but not quite as intensely during this cruise in the central North Pacific by the research vessel Townsend Cromwell. The vessel completed this cruise in a series of oceanographic cruises in the first phase of this study to find the rate of change in the distribution of properties in the trade wind zone of the central North Pacific. The area of operations on this cruise was bounded by latitude 10° N., 27° N. and longitude 148° W., 158° W.

Note: See Commercial Fisheries Review, August 1965 p. 32.



Commercial Fisheries Research and Development Act

GRANT-IN-AID FUNDS APPORTIONED TO STATES FOR FISCAL YEAR 1966:

On July 13, 1965, the U. S. Secretary of the Interior announced the first apportionment--a total of \$4,100,000--in grant-in-aid funds to

Apportionment of Funds for Fiscal Year 1966 Under Section 4 (a) of the Commercial Fisheries Research and Development Act of 1964 1/			
State and Area	Allocations \$1,000	State and Area	Allocations \$1,000
Alabama	40.3	Nevada	20.5
Alaska	246.0	New Hampshire	20.5
Arizona	20.5	New Jersey	167.5
Arkansas	20.5	New Mexico	20.5
California	246.0	New York	178.7
Colorado	20.5	North Carolina	52.3
Connecticut	20.5	North Dakota	20.5
Delaware	38.7	Ohio	45.7
Florida	246.0	Oklahoma	20.5
Georgia	94.6	Oregon	118.3
Hawaii	35.0	Pennsylvania	56.6
Idaho	20.5	Rhode Island	26.6
Illinois	24.4	South Carolina	21.6
Indiana	20.5	South Dakota	20.5
Iowa	20.5	Tennessee	20.5
Kansas	20.5	Texas	246.0
Kentucky	20.5	Utah	20.5
Louisiana	246.0	Vermont	20.5
Maine	223.0	Virginia	173.1
Maryland	180.7	Washington	226.3
Massachusetts	246.0	West Virginia	20.5
Michigan	25.3	Wisconsin	20.5
Minnesota	20.5	Wyoming	20.5
Mississippi	129.1	American Samoa	51.6
Missouri	20.5	Guam	20.5
Montana	20.5	Puerto Rico	161.1
Nebraska	20.5	Virgin Islands	20.5
Total . . .		4,100.0	
1/ Congress adjourned in 1964 before it was able to appropriate funds to implement Section 4(a) of the Act for fiscal year 1965. The apportionment for fiscal year 1966 represents the first appropriation by Congress to implement Section 4(a).			

States under the Commercial Fisheries Research and Development Act of 1964.

The money was appropriated by Congress under Section 4 (a) of the Act for biological research and other studies and for supporting further development of the commercial fisheries resources of the United States.

Apportionment of the fund is based on the value of the commercial fishing industry of the various States, the Commonwealth of Puerto Rico, American Samoa, Guam, and the Virgin Islands. No State may receive more than 6 percent, or less than one-half of one percent, of the fund.

Under the research and development program, the States are reimbursed for up to 75 percent of the costs of approved projects. The research and development programs are administered by the Department of the Interior's Bureau of Commercial Fisheries.

The tabulation lists the apportionment of funds to each State and other entity for the 1966 fiscal year, which began July 1, 1965.

Note: See Commercial Fisheries Review, Dec. 1964 p. 118.



Federal Purchases of Fishery Products

DEFENSE SUBSISTENCE SUPPLY CENTER MOVES TO PHILADELPHIA AND CONSOLIDATES WITH DEFENSE PERSONNEL SUPPORT CENTER:

Effective July 10, 1965, the Headquarters Defense Subsistence Supply Center (DSSC) of the Department of Defense was moved from Chicago, Ill., to Philadelphia, Pa., and consolidated with the Defense Medical Supply Center (DMSC) and the Defense Clothing and Textile Supply Center (DCTSC) into one single organization named the Defense Personnel Support Center, located at 2800 South 20th St., Philadelphia, Pa., 19101.

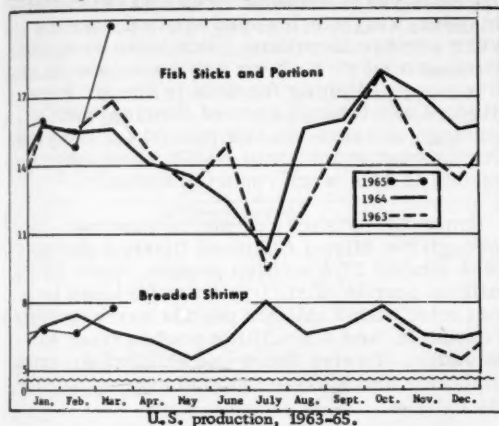
Regional headquarters of the new Center will continue as heretofore: Alameda, Calif.; Brooklyn, N. Y.; Chicago, Ill.; Columbia, S. C.; Fort Worth, Texas; Kansas City, Mo.; Los Angeles, Calif.; New Orleans, La.; Richmond, Va.; and Seattle, Wash.



Fish Sticks and Portions

U. S. PRODUCTION, JANUARY-MARCH 1965:

United States production of fish sticks and fish portions amounted to 50.8 million pounds during the first quarter of 1965, according to preliminary data. Compared with the same quarter of 1964, this was an increase of 3.6 million pounds or 7.7 percent. Fish portions (29.6 million pounds) were up 3.6 million pounds or 13.9 percent, and fish sticks (21.3 million pounds) were up less than 1 percent.



Cooked fish sticks (20.2 million pounds) made up 94.9 percent of the January-March 1965 fish stick total. There were 28.8 million pounds of breaded fish portions produced, of which 22.6 million pounds were raw. Unbreaded fish portions amounted to 716,000 pounds.

Table 1 - U. S. Production of Fish Sticks by Months and Type, January-March 1965 1/

Month	Breaded		
	Cooked	Raw	Total
	... (1,000 Lbs.) ...		
January	6,428	296	6,724
February	6,209	281	6,490
March	7,545	517	8,062
Total 1st Qtr. 1965 1/	20,182	1,094	21,276
Total 1st Qtr. 1964 2/	19,721	1,532	21,253
Total 1964 2/	67,810	5,722	73,532
1/ Preliminary. 2/ Revised.			

The Atlantic States remained the principal area in the production of both fish sticks and fish portions, with 17.1 and 18.9 million pounds, respectively. The Inland and Gulf States ranked second with 9.9 million pounds of fish portions and about 2.0 million pounds of fish sticks. The remaining 3.0 million

Table 2 - U. S. Production of Fish Portions by Months and Type, January-March 1965 1/

Month	Breaded			Un-breaded	Total
	Cooked	Raw	Total		
	(1,000 Lbs.)				
January	2,210	6,792	9,002	197	9,199
February	1,652	6,424	8,076	180	8,256
March	2,432	9,336	11,768	339	12,107
Tot. 1st Qtr. 1965 1/	6,294	22,552	28,846	716	29,562
Tot. 1st Qtr. 1964 2/	5,393	19,709	25,102	863	25,965
Total 1964 2/	20,956	82,135	103,091	2,541	105,632
1/ Preliminary. 2/ Revised.					

pounds of fish sticks and fish portions were produced by firms in the Pacific States.

Note: See *Commercial Fisheries Review*, June 1965 p. 20, May p. 19, Jan. p. 28.



Florida

FISHERY LANDINGS AND TRENDS, 1964:

In 1964, the commercial catch of fish and shellfish landed at Florida ports was 178.0 million pounds with an ex-vessel value of \$29.5 million. Compared with 1963, landings decreased 8.2 million pounds, but the value increased \$1.8 million. Landings of shrimp--the leading species--were 44.5 million pounds (heads-on weight) with an ex-vessel value of \$15.3 million. Shrimp, black mullet (lisa), menhaden, and blue crab accounted for 68 percent of total landings. Fourteen species of finfish and four species of shellfish were landed in quantities greater than 1 million pounds.

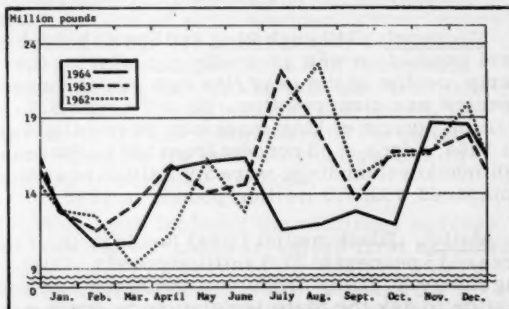


Fig. 1 - Florida landings by months, 1962-64.

Shrimp: Despite the fact that many Florida shrimp companies sent more of their vessels to work out of South American ports, domestic landings of shrimp at Florida ports in 1964 increased 5.0 million pounds over the previous year. The value of the 1964 shrimp

catch was up \$1.3 million. In contrast to 1963 when the price of shrimp declined steadily throughout the year, prices increased in 1964. The ex-vessel value of good quality 21-25 count (heads-off) shrimp landed at Tampa increased from 64.75 cents during January to a high of 82.50 cents a pound in December 1964. The market for shrimp remained strong all year.

Oysters: The oyster harvest in 1964 yielded 2.9 million pounds of meats, about 1.5 million pounds less than in the previous year. Florida's principal producing grounds in the Apalachicola-Eastpoint area yielded fewer oysters. However, during the fall season, large quantities of small oysters were observed, indicating better oyster production in the future. Generally, demand and prices were strong throughout the year.

Crab: The blue crab catch amounted to 21.0 million pounds--a decrease of about 3 percent from 1963. Demand for crab meat was strong throughout the year and again many processing firms imported crabs from other states. Generally, wholesale crab meat prices rose about 20 cents a pound over prices received in 1963. Stone crab landings amounted to over 900,000 pounds, an increase of about 15 percent compared with the previous year.

Spiny Lobster: Landings of spiny lobsters amounted to 3.6 million pounds, 1 percent above 1963. Production in the fall season of the year, although normal, failed to meet the demand. Ex-vessel prices to the fishermen increased to 65 cents a pound.

Mackerel: Although king and Spanish mackerel production was generally good during the early months of the year, the fall run of those species was disappointing. Slightly over 3.3 million pounds of king mackerel were caught in 1964, a drop of 33 percent from 1963. Spanish mackerel landings were 5.9 million pounds compared with 7.5 million pounds in 1963.

Mullet: Black mullet (*lisa*) landings increased 5 percent to 37.8 million pounds. During the year, many producers indicated an intention to ask the State legislature to enact a closed season for the period December 20-January 10. The main purpose of the law would be to keep mullet which have recently spawned off the market.

Other Species: Landings of fresh-water catfish were down 22 percent, while bluefish



Fig. 2 - Over-all view of part of a shrimp packing plant in Coral Gables, Fla. Note stainless steel walls.

and spot each declined 12 percent below the previous year. Grouper, red and yellowtail snapper, king whiting, and spotted sea trout were greater in volume. Due to an expanded European market, there was an expansion of commercial fishing for eels in the St. Johns River-Lake George area of Florida, with landings of some 122,000 pounds for the year. During past years, only 30,000 to 40,000 pounds of eels were reported annually.

Imports: Fishery products entering through the Miami Customs District during 1964 totaled 27.1 million pounds. Over 22.9 million pounds of shrimp were included in that total with 6 million pounds arriving from Venezuela and 4.5 million pounds from El Salvador. Twelve South and Central America countries and Mexico shipped shrimp to Florida in 1964.

Processing: In 1964, fishery firms in Florida processed and packaged seafood with a value of about \$56 million at the wholesale level. Over 50 million pounds of processed shrimp (frozen raw headless, breaded, peeled and deveined) valued at almost \$43 million was processed, while Florida's growing crab industry contributed nearly 3 million pounds of crab meat valued at about \$4 million. Other items processed were shucked oysters, fish fillets and steaks, cooked spiny lobsters, cooked stone crab claws, turtle chowder, canned mullet, and specialties.

The weather in Florida was generally good for fishing operations during 1964 despite the fact that Hurricanes Cleo, Dora, and Hilda passed over or close to parts of Florida. Very little damage to the fishing fleet or fish houses occurred as the result of the storms.

Several new and larger snapper vessels were added to the fleet in the northwest section of the State during the year. Shortly after the end of the year, two of those vessels

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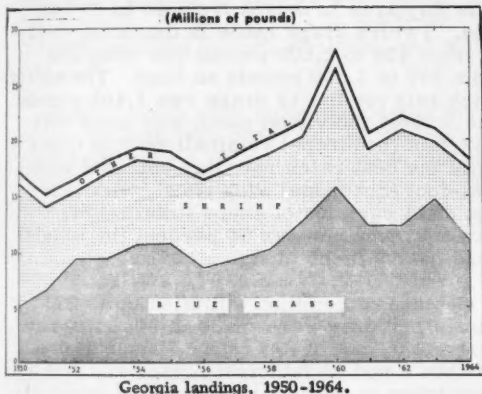
Note: See *Commercial Fisheries Review*, March 1965 p. 31.



Georgia

FISHERY LANDINGS AND TRENDS, 1964:

Landings of fish and shellfish at Georgia ports during 1964 were 18.3 million pounds, valued at \$3.0 million. Compared with 1963, that was a decrease of 13 percent in quantity, but an increase of 14 percent in value. Shrimp landings (heads-on weight) increased 491,300 pounds, while the blue crab catch was down nearly 3.0 million pounds. The leading species landed during 1964 were blue crab and shrimp. They accounted for 95 percent of the quantity and 93 percent of the value of the 1964 catch.



Shrimp landings during 1964 were 5.9 million pounds (head-on weight), an increase of 9 percent above 1963, but 24 percent less than the average for the 5-year period 1959-63. The average ex-vessel shrimp price per pound (heads-on weight) during 1964 was 39 cents--6 cents higher than in 1963. The size composition of the 1964 shrimp catch was a factor affecting the average ex-vessel price. During 1963, shrimp of the 21-30 count size made up 20 percent of the landings, whereas in 1964 that size made up 34 percent of the catch.

Blue crab landings were 11.5 million pounds, a decrease of 3.0 million pounds below the previous year. Pot and trap crabs sold at 4 to 6 cents a pound, and otter trawl crabs from 3 to 5 cents a pound during 1964.

Oyster production in 1964 was 195,800 pounds of meats, a decline of 39,600 pounds from 1963.

Landings of all major species of finfish declined during 1964. Fish caught for human consumption decreased from 624,650 pounds in 1963 to 517,277 pounds in 1964.



Great Lakes Fisheries Explorations and Gear Development

LAKE SUPERIOR TRAWLING STUDIES CONTINUED:

M/V "Kaho" Cruise 25 (May-June 1965): The area of operations during this 38-day cruise in Lake Superior by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Kaho was between Munising, Mich., and Duluth, Minn. In addition to seasonal monitoring of previously established stations in the central portion of the lake, the cruise was extended into the western end where preliminary trawling explorations were conducted.

Primary objectives of the cruise were to: (1) determine the availability of various species of fish to bottom trawls; (2) locate additional areas suitable for trawling, particularly west of the Keweenaw Peninsula; (3) demonstrate commercial production potential of chubs with a larger net and longer drags; and (4) study the vertical and horizontal distribution patterns of fish concentrations with an echo-sounder. Other objectives were to: (1) obtain length-frequency data on various species of fish to augment biological studies; (2) collect lake trout biological data; (3) collect fish and bottom material for botulism studies; and (4) collect chub samples for technological studies involving processing methods.

Highlights included the continued success of trawling for chubs in waters first explored immediately adjacent to the eastern side of the Keweenaw Peninsula in 1964 and the attainment of substantial evidence that chubs can be caught readily in trawls on the western side of the peninsula all the way to Duluth.

Initial operations west of the Keweenaw Peninsula were very encouraging with the location of 70 miles of trawlable grounds from

Fourteen Mile Point near Ontonagon, Mich., to a point about 25 miles northeast of Ashland, Wis., and 60 miles of clear bottom from Sand Island (near Cornucopia, Wis.) to Duluth.

The species composition of the total catch of this cruise (21,600 pounds) was 91 percent chubs, 3.5 percent lake trout, 2 percent whitefish, 1.5 percent smelt, and 1 percent suckers.

Concentrations of chubs were located on both sides of the Keweenaw Peninsula. On the east side of the peninsula, consistently good catches were made in depths of 44 to 46 fathoms, while on the western side of the peninsula, best catches occurred between 33 to 37 fathoms. Drags made in the Grand Traverse Bay area yielded catches of chubs up to 2,600 pounds in a one-hour drag with a 52-foot (headrope length) standard trawl net, and 2,200 pounds in 40 minutes with a 70-foot (headrope length) wing trawl. Commercial production potential was also demonstrated west of the Keweenaw Peninsula where a catch of 1,500 pounds of chubs was made in a half-hour drag at 35 fathoms north of Sand Island. A total of 19,500 pounds of chubs was caught during the cruise. Drags producing chubs in amounts ranging from one to 2,600 pounds totaled 25.2 hours of fishing time. Although the production rate was much higher in certain areas and depths, the average catch rate for the 25.2 hours of fishing was 776 pounds an hour, an amount considered of commercial significance. Two-thirds of the total catch of lake trout were taken in water less than 33 fathoms where the average catch of trout per drag was 13 pounds, while in water deeper than 33 fathoms an average of only 6 pounds of trout per drag was taken. Three-quarters of the trout taken in the shallow water were contained in 9 drags and once such concentrations are located they can be avoided. Efforts to return trout to the water in good condition were successful throughout the investigations.

A comparative day-night study was conducted in Keweenaw Bay to determine differences in catch rates. Although slightly more smelt were caught at night in shallower water, the results were inconclusive. During the cruise, demonstrations were made for commercial fishermen and assistance was provided to the experimental commercial trawler *Nichevo* from Bayfield, Wis.

FISHING OPERATIONS: A total of 79 drags was made during the cruise--70 with a 52-foot (headrope) Gulf of Mexico-type fish trawl and

9 with a 72-foot modified wing trawl. Fifty-one drags were made between Munising and the Keweenaw Peninsula and 28 were made from the Keweenaw Peninsula west to Duluth. All drags were of 30-minute duration except 16 which were terminated early due to encounters with rough bottom or set fishing gear, or for exploratory purposes in unfamiliar waters, or for assessment of commercial potential. Seven drags were extended to one hour to study the production rates of longer drags. Snags were encountered during 7 drags. No damage resulted on 2 of them, minor damage occurred on 2, and major net damage occurred in drags made in 13 fathoms off Superior, Wis., 20 fathoms in Shelter Bay, and 20 fathoms in Keweenaw Bay.

FISHING RESULTS (Munising to Keweenaw Peninsula): Good to excellent catches of chubs were made east of the Keweenaw Peninsula in the Grand Traverse Bay to Bete Gris Bay area in depths from 40 to 45 fathoms. Twelve drags made in that area yielded from 430 to 2,600 pounds per drag and from 750 to 3,300 pounds an hour. The hourly catch rate for the 12 drags was 1,405 pounds. The largest individual catch was made with a 52-foot (headrope) semiballoon fish trawl while the best catch rate was obtained with a 72-foot (headrope) wing trawl. Examination of 11 samples of chubs (totaling 241 pounds) revealed over 86 percent (by weight) were over 9 inches long.

Catches of common whitefish up to 230 pounds per drag were made in Munising Bay, Huron Bay, and in Keweenaw Bay at depths between 8 and 35 fathoms. Cisco and smelt were taken in only small quantities in all areas monitored. Catches of lake trout amounted to about 12.5 pounds per half-hour drag in depths of 32 fathoms and less, and 6.5 pounds per half-hour in depths of 33 fathoms and over. Catches of other species were insignificant and included round and pigmy whitefish, burbot, alewife, and stickleback.

FISHING RESULTS (Houghton, Mich., to Duluth): In the areas monitored from Houghton to Duluth, the heaviest concentrations of chubs were consistently located in depths from 32-37 fathoms. Good catches of chubs (450 and 270 pounds) were taken in the Ontonagon area from Fourteen Mile Point to the Porcupine Mts. Catches ranging from 300 pounds to 1,500 pounds per half-hour were taken in that depth range from an area extending from just north of Sand Island in the Apostles to a point directly north of the

Brule River (12 miles WNW. of Port Wing). No significant amounts of lake trout were taken in any drags east of Bayfield, Wis., while in the Apostle Islands area and off Cornucopia, concentrations of lake trout were heavier. However, trout could be successfully avoided by fishing deeper than 32-33 fathoms. A comparison tow was made with the trawler Nichevo fishing at 33-34 fathoms and the vessel Kaho at 27-28 fathoms. The Kaho took 10 times more trout. In all drags west of the Keweenaw Peninsula the average taken per 30-minute drag was 10 pounds while beyond 33 fathoms the average was 5 pounds per 30-minute drag.

The largest catches of smelt were 35 and 45 pounds taken in 12-13 fathoms off Duluth. Catches of 90 and 100 pounds of longnose suckers were taken in the same area. No other species were taken in significant amounts and only 3 pounds of alewife were taken in all drags made. Other species in the trawl catches included burbot, sculpins, and whitefish.

Hydrographic data collected during the cruise included the recording of thermal gradients using a bathythermograph and continuous surface temperature recorder. Bottom temperatures ranged from 35° to 40° F. and surface temperatures ranged from 35° to 45° F.

Note: See Commercial Fisheries Review, February 1965 p. 22.

LAKE MICHIGAN TRAWLING STUDIES CONTINUED:

M/V Kaho Cruise 26 (June 21-30, 1965): A 10-day exploratory fishing cruise in northern Lake Michigan and Green Bay by the U. S. Bureau of Commercial Fisheries vessel Kaho was completed on June 30, 1965. The primary objective of the cruise was to extend knowledge regarding the seasonal and bathymetric distribution and abundance of alewife, smelt, chub, and yellow perch stocks and their availability to bottom trawls. Secondary objectives were to: (1) collect fish and bottom samples for botulism studies; (2) obtain length-frequency data on chubs and alewife to supplement biological studies; (3) collect scale samples from alewife; and (4) collect sculpin samples for technological studies.

Commercially significant quantities of alewife were taken in all areas monitored with the best catches occurring in the shallower depths, reflecting the seasonal inshore

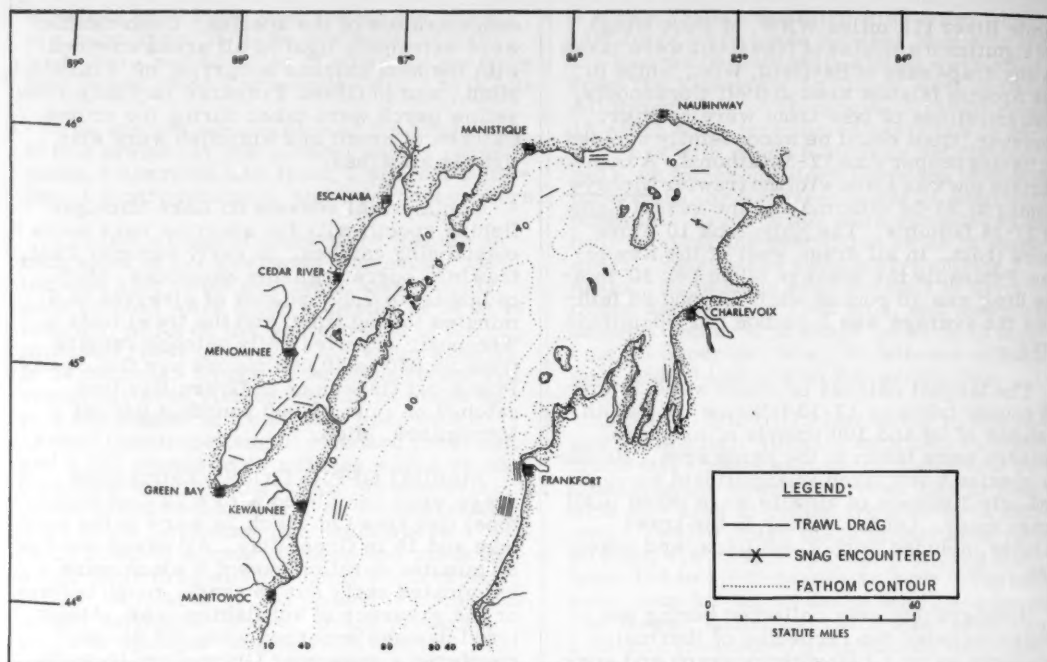
concentration of the species. Chub catches were extremely light in all areas covered with the best catches occurring off Frankfort, Mich., and in Grand Traverse Bay only a few yellow perch were taken during the cruise. Catches of smelt and whitefish were also light in all areas.

Commercial vessels on Lake Michigan fishing specifically for alewives have taken outstanding catches. In early summer 1965, trawlers operating from Saugatuck, Mich. caught up to 9,000 pounds of alewives in 6 minutes towing time, and the trawl fleet in Wisconsin reported daily catches ranging from 25,000 to 80,000 pounds per fishing day. Pound-net fishermen in Green Bay took catches of up to 72,000 pounds a day off Menominee, Mich.

FISHING OPERATIONS: Thirty-nine drags were completed with a 52-foot (head-tope) fish trawl of which 24 were in the open lake and 15 in Green Bay. All drags were of 30 minutes duration except 3 which were terminated early due to snags, rough bottom, or the presence of set fishing gear. Major trawl damage occurred when the net encountered a snag near Grays Reef in northern Lake Michigan. Bottom topography and vertical distribution of fish were continuously monitored and recorded with a high-resolution echo-sounder.

FISHING RESULTS: Northern Lake Michigan: Commercially significant catches of alewife were taken in Grand Traverse Bay at 12 fathoms and in northern Lake Michigan from Manistique to Naubinway at 10, 12, and 22 fathoms. Chub catches were insignificant with the best catches taken at 25 fathoms off Frankfort (270 pounds) and at 45 fathoms in Grand Traverse Bay (200 pounds). Smelt were taken in only minimal amounts. Five yellow perch totaling 8 pounds were taken in Grand Traverse Bay. Whitefish were taken in amounts of up to 35 pounds per drag at 12 fathoms in Grand Traverse Bay, at 14 fathoms off Beaver Island, and at 10 and 12 fathoms in the northern area of the lake between Naubinway and Manistique.

Green Bay: Good Catches of alewife were taken in Green Bay--the best catches, 630 and 950 pounds, occurred at 5 fathoms in the southern area of the bay. Smelt catches were light except for one 480-pound catch taken at 12 fathoms south of Menominee. Only 3 individual yellow perch were taken in all drags made in the bay. Catches of other species were insignificant.



Lake Michigan explorations, M/V Kaho cruise 26.

HYDROGRAPHIC DATA: Surface water temperatures of Lake Michigan ranged from 43° to 55° F; those in Green Bay from 60° to 63° F. Fishing (bottom) temperatures ranged from 39° to 50° F.

Note: See *Commercial Fisheries Review*, July 1965 p. 22.

LAKE HURON TRAWLING STUDIES:

M/V Kaho Cruise 27: The U. S. Bureau of Commercial Fisheries research vessel Kaho was scheduled to depart July 14, 1965, on a 22-day exploratory fishing cruise in Lake Huron. The cruise is the first in a series to explore more effective and efficient methods for capturing and handling the fish stocks in Lake Huron.

Saginaw Bay and adjacent waters in central and southern Lake Huron were to be the main areas of operation during the cruise. The primary purpose was to determine the location, bathymetric distribution and relative abundance of various species of fish and their seasonal availability to standard bottom trawls. Mesh-selectivity studies were also

planned with particular emphasis directed towards yellow perch.



Gulf Fisheries Explorations and Gear Development

SHRIMP GEAR STUDIES CONTINUED:

M/V George M. Bowers Cruise 60 (May 24-July 1, 1965): This cruise, which consisted of short trips in St. Andrews Bay, Fla., was a continuation of the Bureau of Commercial Fisheries studies on the electrical parameters necessary to deburrow shrimp from varying bottom types. During the cruise, SCUBA divers recorded the rates of deburrowing and escape reactions of shrimp exposed to different electrical voltages and pulse rates. The 2,200 feet of color motion-picture film exposed during the cruise provided a record of the shrimp behavior under various conditions for detailed study on shore. Divers reported more rapid deburrowing behavior with increased voltages generated within the test area.

Shrimp deburrowing behavior from a soft sand bottom found in St. Andrews Bay was studied during the cruise. Similar behavior observations of shrimp burrowed in hard sand bottom exposed to various electrical voltages were initiated on the Tortugas fishing grounds during Cruise 59 of the George M. Bowers. Those types of behavioral observations will be undertaken on different bottom types on future cruises to determine whether or not the type of substrata affects escape reactions of electrified shrimp.

Note: See Commercial Fisheries Review, July 1965 p. 24.



Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-30 (June 11-24, 1965): Small brown shrimp (68 count) again were evident, as in May, throughout the sampling area covered during this cruise. As part of a continuing Gulf of Mexico shrimp distribution study, 8 statistical areas were covered by the chartered research vessel Gus III, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex.

A total of 27 standard 3-hour tows with a 45-foot flat trawl, 46 plankton tows, 53 bathythermograph (BT), and 176 water (Nansen bottle) casts were made on the cruise.

The best catches of small brown shrimp were made in areas 19 and 20--mostly in the 11-20 fathom depth range. Catches of the same size brown shrimp also were made in the up to 10-fathom depth in several other areas but the amounts taken in each tow were generally small.

The over 20-fathom depth range in most areas yielded larger brown shrimp of 12-15 and 15-20 count. Areas 16 and 17, in particular, yielded excellent catches (38 and 46 pounds, respectively) of 12-15 count shrimp from 25 fathoms.

White shrimp catches were mostly light in all areas worked but ran to large (15-20 count) shrimp. Areas 16 and 17 yielded the best white catches, with an average catch of 14 pounds in the up to 10-fathom depth from each of those areas. Smaller amounts of white shrimp ranging from 2 to 8 pounds in each tow from other areas worked were also taken in the up to 10-fathom depth.

Only a scattering of pink shrimp were caught during the cruise, mostly all small.

The vessel also occupied a 24-hour current measurement station in 8 fathoms of water south of Morgan City, La., to supplement data previously collected on white shrimp spawning grounds.

Note: See Commercial Fisheries Review, August 1965 p. 40.



Industrial Fishery Products

U. S. FISH MEAL, OIL, AND SOLUBLES:

Major Indicators for U. S. Supply, May 1965: United States production of fish meal and fish oil in May 1965 was lower by 27.7 and 25.5 percent, respectively, as compared with May 1964. Production of fish solubles was lower by 19.4 percent.

Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oil, May 1965					
Item and Period	1/1965	1964	1963	1962	1961
Fish Meal:					
Production:			(Short Tons)		
May	23,157	32,047	39,902	40,504	34,446
Jan.-May 2/	42,119	47,698	56,216	60,665	48,103
Year 3/	-	235,252	255,907	312,259	311,265
Imports:					
May	30,475	59,543	30,399	25,269	25,116
Jan.-May	165,384	221,914	163,482	114,433	88,509
Year	-	439,143	376,321	252,307	217,845
Fish Solubles 4/:					
Production:					
May	10,364	12,859	16,997	16,786	13,629
Jan.-May 2/	15,970	20,152	27,395	26,762	22,428
Year 3/	-	93,296	107,402	124,649	112,254
Imports:					
May	187	263	438	265	283
Jan.-May	3,006	1,802	2,116	3,418	1,012
Year	-	4,505	7,112	6,308	6,739
Fish Oils:			(1,000 Lbs.)		
Production:					
May	22,291	29,939	33,544	33,436	34,674
Jan.-May 2/	34,158	35,763	41,396	41,598	39,339
Year 3/	-	180,198	185,827	250,075	258,118
Exports:					
May	316	9,329	22,150	6,491	3,192
Jan.-May	12,059	56,022	97,551	58,084	47,082
Year	-	151,469	262,342	123,050	122,486

1/Preliminary

2/Data for 1965 based on reports which accounted for the following percentage of production in 1964: Fish meal, 89 percent; solubles, 89 percent; and fish oils, 99 percent.

3/Small amounts (10,000 to 25,000 tons) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.

4/No homogenized fish was produced in 1964.

Production by Areas, June 1965: Preliminary data on U. S. production of fish meal, oil, and solubles for June 1965 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U. S. Production 1/ of Fish Meal, Oil, and Solubles, June 1965 (Preliminary) with Comparisons			
Area	Meal Short Tons	Oil 1,000 Pounds	Solubles Short Tons
June 1965:			
East & Gulf Coasts 2/	42,952	38,286	16,446
West Coast 3/	2,285	305	1,226
Total	45,237	38,591	17,672
Jan.-June 1965			
Total	87,356	72,749	33,642
Jan.-June 1964			
Total	96,651	78,624	39,025
1/ Does not include crab meal, shrimp meal, and liver oils.			
2/ Includes a small quantity from the Great Lakes.			
3/ Includes American Samoa and Puerto Rico.			

* * * * *

Production, May 1965: During May 1965, a total of 23,157 tons of fish meal and 22.3 million pounds of marine-animal oil was produced in the United States. Compared with May 1964 this was a decrease of 3,890 tons of fish meal and about 7.6 million pounds of marine-animal oil. Fish solubles production a-

U. S. Production of Fish Meal, Oil, and Solubles May 1965 1/ with Comparisons				
Product	May		Jan.-May	
	1/1965	1964	1/1965	1964
Total 1964				
Fish Meal and Scrap: (Short Tons).				
Herring	2/	-	1,275	415
Menhaden 3/	18,232	22,700	25,700	25,747
Tuna and mackerel	1,777	1,486	8,909	6,485
Unclassified	3,148	7,861	6,145	15,051
Total	23,157	32,047	42,119	47,698
Shellfish, marine-animal meal and scrap	4/	4/	4/	4/
Grand total meal and scrap	4/	4/	4/	4/
Fish Solubles: (1,000 Pounds).				
Menhaden	8,042	9,399	10,189	10,769
Other	2,322	3,460	5,781	9,383
Total	10,364	12,859	15,970	20,152
Oil, body: (1,000 Pounds).				
Herring	2/	-	576	132
Menhaden 3/	21,758	28,480	31,456	31,543
Tuna and mackerel	275	221	1,358	1,127
Other (including whale)	258	1,238	762	2,961
Total oil	22,291	29,939	34,152	35,763
1/ Preliminary data.				
2/ Included in other or unclassified.				
3/ Includes a small quantity of thread herring.				
4/ Not available on a monthly basis.				

mounted to 10,364 tons--a decrease of 2,495 tons as compared with May 1964.

* * * * *

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-May 1965: Based on domestic production and imports, the United States available supply of fish meal for the first 5 months in 1965 amounted to 207,503 short tons--62,109 tons (or 23.0 percent) less than during the same period in 1964. Domestic production was 5,579 tons (or 11.7 percent) less, and imports were 56,530 tons (or 25.5 percent) lower than in January-May 1964. Peru continued to lead other countries with shipments of 141,119 tons.

The United States supply of fish solubles during January-May 1965 amounted to 18,976 tons--a decrease of 13.6 percent as compared with the same period in 1964. Domestic production dropped 20.8 percent, but imports of fish solubles increased 66.8 percent.

U. S. Supply of Fish Meal and Solubles, January-May 1965			
Item	Jan.-May 1/1965	1964	Total 1964
. (Short Tons).			
Fish Meal and Scrap:			
Domestic production:			
Menhaden	25,700	25,747	160,349
Tuna and mackerel	8,999	6,485	21,113
Herring	1,275	415	8,881
Other	6,145	15,051	44,909
Total production	42,119	47,698	235,252
Imports:			
Canada	17,020	24,096	54,769
Peru	141,119	181,196	348,025
Chile	3,808	9,104	12,942
So. Africa Rep.	700	6,138	18,581
Other countries	2,637	1,380	4,826
Total imports	165,384	221,914	439,143
Available fish meal supply	207,503	269,612	674,395
Fish Solubles:			
Domestic production 2/	15,870	20,152	93,296
Imports:			
Canada	766	877	1,553
So. Africa Rep.	-	705	987
Other countries	2,240	229	1,965
Total imports	3,006	1,802	4,505
Available fish solubles supply	18,976	21,954	97,801
1/ Preliminary.			
2/ 50-percent solids.			



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Maine

FISHERIES, 1964:

Commercial fishery landings in Maine during 1964 amounted to 192.6 million pounds with an ex-vessel value of \$22.0 million--a decline of 33 percent in quantity, but a gain of 3 percent in value from 1963.



Fig. 1 - Maine fisherman removing lobsters from his traps.

The lobster fishery accounted for most of the increase in value. Maine lobster landings of 21.4 million pounds in 1964 had an ex-vessel value of \$14.2 million, while lobster landings in 1963 of 22.8 million pounds were worth only \$12.6 million. Lobster landings accounted for 65 percent of the value of the total catch in 1964.



Fig. 2 - Close-up of Maine fisherman digging bloodworms.

The overall decline in 1964 landings was due mainly to a sharp drop in herring landings--down from 152.3 million pounds in 1963 to 60.9 million pounds in 1964. Ocean perch landings also dropped from 63.9 million pounds in 1963 to 58.9 million pounds in

1964. The decline was partly offset by an increase in whiting landings from 15.9 million pounds in 1963 to 25.3 million pounds in 1964.

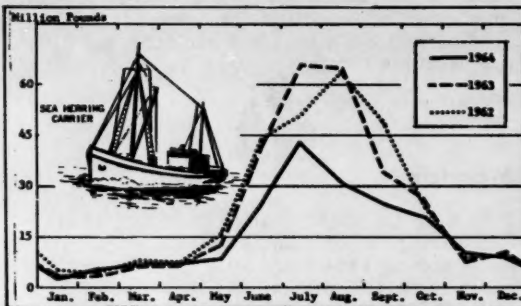


Fig. 3 - Maine landings by months, 1962-64.

Sea herring, ocean perch, whiting, and lobster accounted for 86 percent of Maine's total catch in 1964. Other leading species landed in Maine during 1964 were cod 2.4 million pounds, haddock 2.9 million pounds, white hake 3.5 million pounds, flounder (all species) 1.2 million pounds, mackerel 488,000 pounds, crab 2.0 million pounds, soft clam meats 1.8 million pounds, and sea scallop meats 916,900 pounds. The harvest of sea moss amounted to 2.5 million pounds, and production of blood and sand worms totaled 1.5 million pounds with a value of \$1.2 million.

UNIVERSITY OF MAINE RESUMES MARINE RESEARCH:

Plans to resume a marine research program were announced by the University of Maine in the spring of 1965 after a 130-acre site on the Damariscotta River in Walpole was donated to the University for the establishment of a marine biological laboratory. It will be known as the Ira C. Darling Center for Research, Teaching, and Service.

The location on the Damariscotta River gives protection from the weather while providing access to the ocean. The property also has adequate buildings to house initial research facilities.

Research at the new center, which was scheduled to begin in the summer of 1965, will include the cataloguing and identification of all forms of marine life to be found in the immediate vicinity. Future projects may in-

clude cooperative research with Federal and State agencies.

The president of the University of Maine said the new research center "would provide much-needed facilities for oceanographic studies in a State that has had long and close ties with the sea."



Maryland

FISHERY LANDINGS AND TRENDS, 1964:

Landings of fish and shellfish at Maryland ports during 1964 were 70.0 million pounds, valued at \$11.8 million--an increase of 26 percent in quantity and 10 percent in value as compared with 1963. Blue crabs, soft clams, and oysters accounted for 59 percent of the 1964 catch.

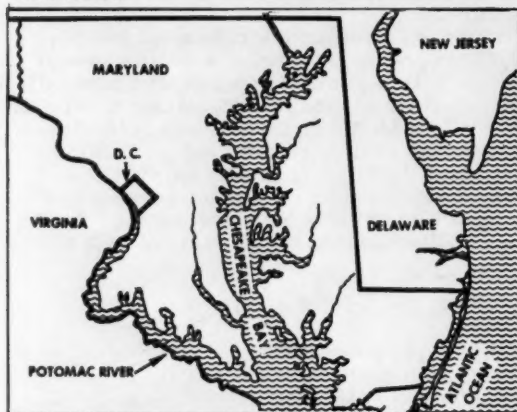


Fig. 1 - Maryland fishing areas.

Crabs: Hard blue crab landings totaled 21.6 million pounds in 1964, an increase of 4.6 million pounds over 1963. Crab ex-vessel prices averaged higher in 1964 as did crab meat prices due to a shortage of crabs for picking.

Soft and peeler crab landings in 1964 totaled 3.5 million pounds (approximately 1,165,900 dozen), a 66-percent increase over 1963.

Soft Clams: Record soft clam landings in 1964 of 680,400 bushels (yielding 8,164,332 pounds of clam meats) represented a 19-percent increase over the 1963 total. The unrestricted clamming allowed in the Potomac River in 1964 contributed to the record catch.



Fig. 2 - Picking crab meat from blue crabs in a Maryland plant.

Ex-vessel prices averaged lower than in 1964 due to the larger supply.

Oysters: The 1964 oyster harvest of 1,702,630 U. S. bushels (yielding 8,104,516 pounds of oyster meats) was up slightly from the 1963 record-low. But the 1964 harvest was the second lowest on record. The spring catch was light as oysters became scarce, and their yield was poor. Local packers again purchased shell and shucked oysters from the Gulf States to supply orders. The fall oyster harvest improved considerably over the previous year, although ex-vessel prices were down.

The MSX organism which has caused extensive oyster mortalities in lower Chesapeake Bay extended its range to include larger portions of Tangier Sound and its tributaries along with Pocomoke Sound. Higher salinities over the past two years may have played a roll in the spread of the parasite.

Finfish: Maryland landings of finfish in 1964 totaled 28.2 million pounds valued at \$1.5 million, as compared with 21.1 million pounds valued at \$1.4 million in 1963. The 1964 landings of menhaden (5.7 million pounds) and scarpfish (9.5 million pounds) accounted for much of the increase in quantity.

Landings of striped bass--Maryland's leading foodfish--dropped from 3.7 million pounds in 1963 to 3.3 million pounds in 1964. The white perch catch of 638,232 pounds in 1964 was down sharply from the 1.4 million pounds landed in 1964. Landings of alewife (1.3 million pounds) were also down. There

was a small increase in 1964 landings of shad (890,085 pounds) and fluke (556,521 pounds).

In 1964, five West Coast tuna purse-seine vessels delivered to Maryland 1.4 million pounds of bluefin, 1.1 million pounds of skipjack, and 0.3 million pounds of yellowfin tuna (included in the landings were about 0.5 million pounds of tuna caught in the Pacific Ocean).



Massachusetts

FISHERIES, 1964:

Landings of fish and shellfish in Massachusetts in 1964 totaled 409.6 million pounds with an ex-vessel value of \$35.2 million--a decline of 5 percent in quantity and 4 percent in value from 1963. Fishermen landed 33 percent of the 1964 catch at New Bedford, 31 percent at Gloucester, 26 percent at Boston, and 10 percent at other Massachusetts ports.



Fig. 1 - Mending nets at sea aboard a New England groundfish trawler.

Ocean perch landings at Gloucester dropped from 43.2 million pounds in 1963 to 29.1 million pounds in 1964. That was a major factor in the overall decline in Massachusetts landings.



Fig. 2 - Fishing trawlers tied up at Boston Fish Pier for unloading. At right in foreground is the New England Fish Exchange building.

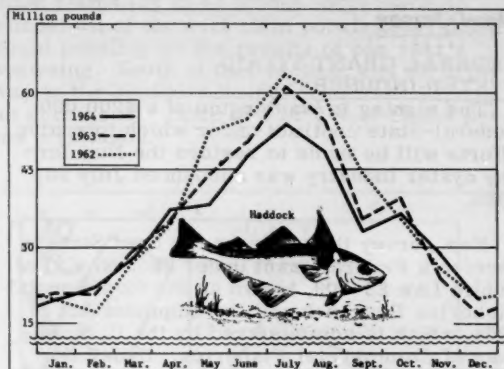


Fig. 3 - Massachusetts landings by months, 1962-64.

At New Bedford, there was a decline of 3.0 million pounds in landings of sea scallop meats, but an increase of 1.9 million pounds in landings of yellowtail flounder. Total landings in 1964 at New Bedford, as well as at Boston, were almost the same as in 1963.

Massachusetts Landings, 1964 and 1963					
Species	1964		1963		
	Quantity Pounds	Value Dollars	Quantity Pounds	Value Dollars	
Alewives, round . . .	3,998,630	39,985	10,896,830	102,836	
Cod, drawn	29,504,382	2,363,568	31,474,840	2,614,781	
Cusk, drawn	1,883,995	98,107	1,263,762	86,627	
Flounders, round:					
Blackback	13,809,239	1,317,585	11,721,826	1,331,955	
Dab	5,530,718	376,816	4,601,682	352,612	
Fluke	1,358,228	441,591	2,281,417	710,653	
Gray sole	2,906,383	317,347	2,364,250	288,285	
Lemon sole	2,083,829	426,909	1,857,718	487,871	
Yellowtail	70,933,339	4,876,911	68,873,761	4,376,587	
Haddock, drawn . . .	114,261,114	11,556,406	106,074,820	11,442,783	
Hake:					
Red, round	2,875,870	32,790	5,067,852	54,822	
White, dressed . . .	2,426,103	176,677	1,885,190	125,498	
Halibut, drawn . . .	196,699	71,698	154,402	57,166	
Herring, sea, round .	1,962,969	36,954	1,850,225	34,785	
Mackerel, round . . .	2,725,435	172,224	1,920,230	184,170	
Ocean perch, round .	30,331,669	1,280,520	44,386,697	2,210,985	
Ocean pout, round . .	2,453,115	32,625	-	-	
Pollock	10,557,807	612,498	10,726,995	595,996	
Swordfish, dressed . .	870,522	308,396	1,294,746	399,895	
Tuna, round:					
Bluefin	2,058,223	143,482	4,924,034	267,750	
Skipjack	1,154,040	84,269	1,587,585	78,690	
Unclassified	-	-	8,086	1,330	
Whiting:					
Round	56,303,425	1,215,270	61,249,309	1,427,206	
Dressed	1,057,690	47,556	3,322,129	135,686	
Wolfish, drawn . . .	666,938	36,637	598,024	37,413	
Unclassified fish . .	32,265,091	766,489	31,403,930	746,407	
Lobsters, northern .	1,694,511	898,745	1,405,174	657,663	
Shrimp	6,925	916	23,068	2,952	
Sea scallop meats . .	13,719,185	7,447,125	16,873,715	7,708,620	
Squid	234,140	11,245	1,755,990	94,549	
Total	409,630,214	85,190,441	431,682,287	36,815,873	

Note: Includes all Massachusetts commercial landings except a small quantity taken in inshore fisheries. In 1963, the landings shown above accounted for 97.7 percent of the total Massachusetts catch. Weights shown represent fresh fish as landed and the values are those received by the vessels.

Overall Massachusetts landings were down for ocean perch, sea scallop meats, whiting, tuna, cod, fluke, swordfish, alewife, and red hake. But there was a noticeable increase in landings of haddock, most species of flounder (other than fluke), and mackerel.



New Jersey

FEDERAL GRANT TO AID OYSTER INDUSTRY:

The signing in Washington of a \$200,000 Federal-State contract under which intensive efforts will be made to restore the New Jersey oyster industry was announced July 20, 1965.

New Jersey thus became the first State to receive a Federal grant under Section 4(a) of Public Law 88-309, known as the Commercial Fisheries Research and Development Act of 1964, which is administered by the U. S. Bureau of Commercial Fisheries. Under the contract, the State is matching \$100,000 provided by Federal funds.

The New Jersey oyster industry, once valued at more than \$10 million annually, was virtually destroyed in 1957/58 by a shellfish disease known as MSX. Research has shown that a small percentage of the residual oysters may be immune to the disease and by using those survivors as seed, the State hopes to revive the industry in Delaware Bay and the Mullica River.

The New Jersey Commissioner of Conservation and Economic Development said that 2 million bushels of oyster shells will be purchased to improve the setting areas during the present oyster spawning season. It is planned to provide at least a million bushels of shells for that purpose each year for the following 5 years.

The initial planting of shells was expected to be completed in August 1965, and sample tests of the spawning results began in September. All work will be supervised by the Director of the New Jersey Division of Shell Fisheries in conjunction with the Shell Fisheries Council, and the Oyster Research Laboratory of Rutgers--the State University.



North Atlantic

SOVIET FISHING ACTIVITY OFF COAST, JULY 1965:

Soviet fishing activity in the Northwest Atlantic commenced in July 1965 with a fleet of about 100 vessels consisting of 20 factoryship stern trawlers, 69 side trawlers, 7 processing and refrigerated transport vessels, 3 base

ships, and 1 tug. This compared with an estimated 180 vessels sighted in June and 68 vessels in July 1964.

During the month there was a week-by-week decline in vessel activity, so that by the end of July not a single Soviet fishing vessel was reported or sighted on Georges Bank and areas south of Nantucket. It was the first time that a complete withdrawal of Soviet vessels occurred during that time of year since they appeared on the scene in 1961. A marked decline in activity was noted in July 1964, but there was a quick return to a large, concentrated fleet in August and September. At that time they converged on a tremendous herring fishery during the time of spawning on the Georges Shoals area.

The abrupt shift in activity during July may conceivably be attributed mainly to lagging fish production--principally whiting and herring--and no doubt has prompted a greater emphasis on a known productive whiting area along eastern Nova Scotia. It has been previously reported that the Soviets were taking only moderate catches of fish on Georges Bank and the area south of Nantucket and consequently have deployed their fleet operation accordingly. It was believed this absence of activity might only be temporary.

During July the main Soviet fishing operation was generally confined to an area 30 to 40 miles south of Nantucket Island. United States fishing vessels had abandoned that area some weeks previous due to poor fishing. Small groups of vessels were located along the eastern regions of Georges Bank but were either under way or engaged in vessel repair and replenishing supplies.

As of the end of July it was estimated that 15 factoryship stern trawlers were operating along the Cultivator Shoals area where United States fishermen had reported seeing a large body of whiting.

Note: See Commercial Fisheries Review, August 1965 p. 45.



North Atlantic Fisheries Explorations and Gear Development

SURF CLAM SURVEY CONTINUED:

M/V Delaware Cruise 65-4 (May 3-June 3, 1965): This cruise by the U. S. Bureau of

Commercial Fisheries exploratory fishing vessel Delaware off the coast of Virginia was a continuation of an Atlantic surf clam survey conducted during the summer of 1963 and 1964. The survey was initiated in cooperation with the Sea Clam Packers Committee of the Oyster Institute of North America.

Surf Clam Area VI off the coast of Virginia was explored. The size of the area is about 1,900 square miles. The depth of water within the area varies from 4 to 60 fathoms. Although 735 stations were occupied during the cruise, less than one-half of the total area was covered.

Objective of the cruise was to investigate the section of Area VI contiguous to that portion of Area V where concentrations of surf clams had been found previously.

Of the 735 stations occupied, 36 tows were made where the catches from the standard 4-minute tow equaled 1 or more bushels. From those 36 tows, the largest catch was 8.9 bushels. Of the remaining 699 tows, 365 produced clams in amounts less than 1 bushel, and 334 tows none. Of the 699 tows, 365 produced some clams while the remaining 334 tows yielded no clams.

SURVEY PROCEDURES: The same procedure was followed during this cruise as during past clam surveys. Samples were taken at each survey station with a 48-inch hydraulic dredge. Each sample consisted of the catch from either a 2- or 4-minute tow (depending on the type of bottom) made at the intersection of grid lines spaced 1 mile apart. Operations began at the northern end of the grid line which forms the western boundary of Area VI and proceeded from that point to other parts of the area. Stations occurring in the vicinity of the many wrecks charted in the area were bypassed.

SURF CLAM CATCHES: In the sections of Area VI surveyed, the best concentrations of surf clams were found within a roughly rectangular-shaped plot extending from its northern boundary south to its center (see chart). In the central portion of that plot, however, only one tow was made where the catch exceeded one bushel; south of the rectangular-shaped plot, within the inshore segments surveyed, none of the tows produced more than one bushel of clams.

In the central section of Area VI, just south of the above described rectangular plot, me-

dium clams ($2\frac{1}{2}$ to $4\frac{1}{2}$ inches long) made up almost all of the surf clam populations; those could possibly be the results of one year's spawning. South of that section, and all of the way to the southern boundary of Area VI, only an occasional catch of 1 or 2 surf clams per tow was taken.



Surf Clam Area VI and producing stations during M/V Delaware cruise 65-4 (May 3-June 3, 1965).

The best concentrations of surf clams in Area VI occurred in sections where the bottom was composed mostly of coarse sand, gravel, or sand and gravel mixed. Most of the poorer catches were made where the bottom was predominantly mud, clay, or mud and clay. However, many poor catches did occur in sandy bottom sections throughout the area. In the lower central section of Area VI, many spots of gravel or sand and gravel were found, although they failed to produce any surf clams.

In Area VI the best catches of surf clams were made in depths of water between 17 and 19 fathoms with some good catches occurring as shallow as 13 fathoms and as deep as 20 fathoms.

SIZE OF SURF CLAMS: All sizes of clams were taken except the very smallest (the clam

dredge used was not designed to take very small clams). As in previously surveyed areas, the predominant size group taken was 5 inches or more in length. Medium surf clams made up the bulk of many of the tows from the area. Few clams less than 1.5 inches were taken during the cruise.

Surf clam shells, along with those of other shellfish species, were taken at most of the stations surveyed. The abundance of shells varied from several shells up to 15 bushels per tow. Considerable numbers of shells were present along with live clams in most of the productive tows; only a few tows were made where the catch sample consisted entirely of live clams. Some tows produced crushed mollusk shells along with other bottom material.

BLACK QUAHOGS: Small quantities of black quahogs were found in many catches at scattered points throughout Area VI, but they never occurred in amounts equal to those found during the survey of other areas. One or 2 were frequently taken in a tow along with surf clams; the quahogs seldom occurred by themselves. Very few shells of that species were taken in the area.

CONTINUATION OF THE SURVEY: Summer and fall clam survey cruises were scheduled for August 30 to September 11 and September 29 to October 15, 1965.

Note: See Commercial Fisheries Review, June 1965 p. 28.

TRAWL GEAR EVALUATIONS:

M/V Delaware Cruise 65-5 (June 14-June 25, 1965): The objectives of this cruise were to: (1) measure the in-use dimensions of four trawls of special interest to the east coast fishing industry, and (2) fish two of the trawls comparatively under similar conditions.

MEASUREMENT OF IN-USE DIMENSIONS: The measurements were made with a "sonic" system developed during Delaware Cruises 63-2 and 63-3. The system utilizes echo-sounding transducers mounted on the wings and headrope of the trawl and connected electrically to a sounding machine (fig.). Two traces are printed simultaneously on the recorder. Those traces represent (1) the distance between the center of the headrope and the bottom, and (2) the distance between the wing ends.

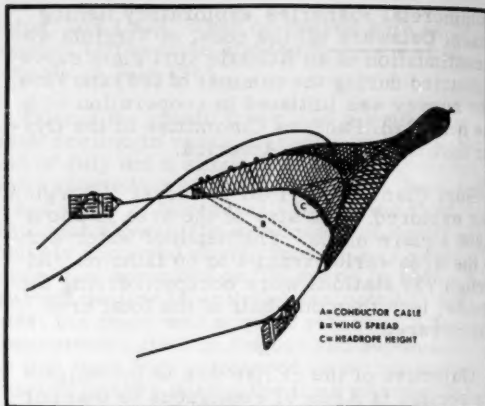


Diagram of otter trawl as rigged for measuring horizontal and vertical openings during fishing operations. Note location of transducers and cables used in "sonic" trawl measuring and telemetering system.

The four nets measured were: (1) a No. 41 otter trawl of No. 54 braided nylon throughout (exclusive of cod end), rigged with 16-inch wooden roller gear; (2) a Skagen type "S" deep-sea wing trawl of polyethylene twine, rigged with 20-inch rubber roller gear; (3) a French Granton trawl of manila and polypropylene twine, rigged with 20-inch rubber roller gear; and (4) an Atlantic western trawl, Model III, of polyethylene twine, rigged with 20-inch rubber roller gear. All cod ends were No. 102 braided nylon. The Atlantic western trawl was fished with oval B.M.V. otter boards weighing 2,200 pounds each and measuring 10 feet 4 inches by 5 feet 10 inches. The other 3 nets were fished with rectangular otter boards weighing 1,250 pounds each and measuring 10½ feet by 4½ feet.

Trials were carried out on the northern edge of Georges Bank in water 27 fathoms deep. Tests with each trawl were made at three speeds, with two ratios for warp-length to depth, and in four directions. The nets were towed with, against, and across the tidal current to minimize the current's effect upon the average measurements for headrope height and wing spread.

The dimensions of each net varied widely due to changes in warp-length, speed, and tidal current. Generally, any factor causing the wing spread to increase would result in a corresponding decrease in headrope height. The largest single variable influencing wing spread was the towing warp-to-depth ratio.

Table 1 - Comparison of Extremes of Wing Spreads and Headrope Heights During Tows

Trawl	Measurement	Warp-to-Depth Ratio	Engine Speed	Wing Spread	Headrope Height
			(r.p.m.)	(feet)	(feet)
No. 41	Max. headrope	3:1	200	52	14
	Min. headrope	4:1	200	50	9
	Max. wing spread	4:1	210	54	9
	Min. wing spread	3:1	200	44	12
Skagen	Max. headrope	3:1	200	36	23
	Min. headrope	4:1	200	51	9
	Max. wing spread	4:1	210	52	9
	Min. wing spread	3:1	200	36	23
Granton	Max. headrope	3:1	210	38	22
	Min. headrope	4:1	190, 200, 210	50	10
	Max. wing spread	4:1	210	56	12
	Min. wing spread	3:1	200	34	20
Atlantic Western	Max. headrope	2.5:1	210	36	30
	Min. headrope	4:1	210	50	10
	Max. wing spread	3:1	190	56	18
	Min. wing spread	2.5:1	200	36	30

A 4:1 ratio caused the maximum wing spread in this series. Maximum headrope heights were obtained at a 3:1 ratio, with a sacrifice of wing spread (table 1).

Average headrope height and wing spread of the No. 41 trawl as measured during the cruise were 10 feet and 48 feet, respectively. Those figures do not represent the optimum configuration of the net, but an average of the measured heights and of measured spreads for all combinations of warp length, speed, and tide. For the other trawls measured, the average dimensions were as follows (for headrope height and wing spread): Skagen trawl--18 feet and 44 feet, Granton trawl--15 feet and 42 feet, Atlantic western trawl--20 feet and 42 feet.

The Atlantic western trawl had an average headrope height of twice that of the No. 41 and an average wing spread of 6 feet less. The Granton and the Skagen had headrope heights of 5 feet and 8 feet greater than the No. 41 and wing spreads of 6 feet and 4 feet less than the No. 41, respectively. (It is interesting to note that the nylon No. 41 trawl used during this cruise had an average headrope height of from 2.5 to 3 feet greater than that of the No. 41 manila trawl used in previous measurement work.)

COMPARATIVE FISHING--ATLANTIC WESTERN VS. NO. 41 TRAWL: The second phase of the cruise was designed to study the relative catching efficiency of the Atlantic western trawl as compared to the No. 41 trawl. A towing schedule was set up to equate the number of tows of each net for each period of daylight and darkness. Three or 4

tows in succession were made with one trawl before changing to the other trawl on the opposite side of the vessel. All tows were of 1-hour duration. The Atlantic western trawl was towed at 210 r. p. m. with a warp-to-depth ratio of 3:1. The No. 41 trawl was towed at 200 r. p. m. with a 3:1 warp-to-depth ratio. The optimum dimensions of the net, as determined earlier in the cruise, occurred at those speeds and warp ratios. The dimensions of the Atlantic western trawl were headrope height 25 feet and wing spread 43 feet. Corresponding dimensions of the No. 41 trawl were 12 feet and 50 feet. The Atlantic western trawl was rigged with 15-fathom legs and the No. 41 utilized legs of 5 fathoms. Ground cables of 10-fathom length were used with each net.

Table 2 - Catch Ratios--Advantage of Atlantic Western Over No. 41 Trawl By Species

Species	Day	Night	Day & Night Combined
 (Catch Ratio 1/)		
Haddock	1.4	2.2	1.7
Cod	2.7	8.0	4.2
Flounders	12.5	2.3	4.5
Skate	8.1	3.4	3.9

1/Catch ratio = $\frac{\text{Total pounds in Atlantic western trawl}}{\text{Total pounds in No. 41 trawl}}$

Areas fished included the Northern Edge, Winter Fishing grounds, Bight of Clarks, the Channel area, and Pollack Rip area, all of which are on Georges Bank or adjacent to it.

On the basis of 40 tows for each net, the combined catch of all species for the Atlantic western trawl was about $2\frac{1}{2}$ times that of the No. 41. The catch advantage for selected species is indicated in table 2.

In evaluating the data, notice must be taken of various factors which might bias the results. Although the gear appeared to be fishing satisfactorily, further tests may reveal the need for minor adjustments in either the rigging of the net or the doors to improve the efficiency of the trawls. Fish were fairly scarce during the trial period; the average catch per 1-hour tow was about 400 pounds total for the species listed in table 2. Also, because of the limited time available, not all types of bottom were fished.

No significant problems were encountered in handling the Atlantic Western trawl. The oval trawl doors were set out without difficulty, and no more time was required to handle either the net or the doors than is usual with a No. 41 trawl. Neither net suffered extensive damage during the trials. Tear-ups were limited to the wing ends in each trawl.

Additional field work is being planned to further evaluate the Atlantic Western trawl

and the other two trawls measured during the cruise.

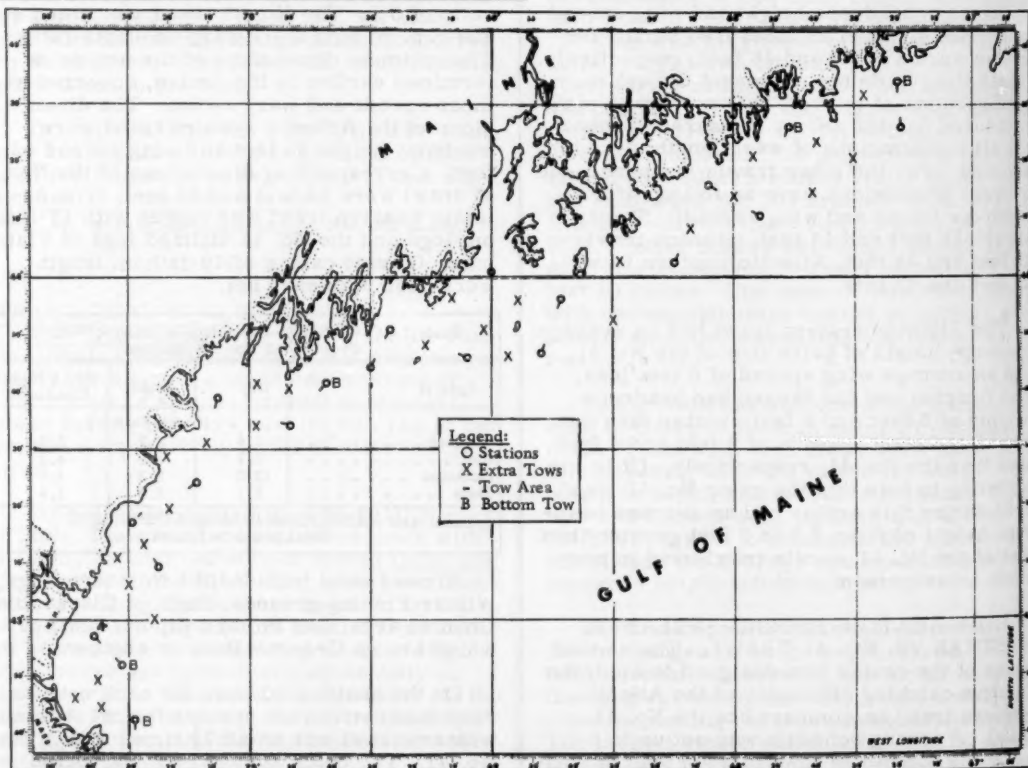
Note: See Commercial Fisheries Review, Nov. 1963 p. 37 and June 1965 p. 37.



North Atlantic Fisheries Investigations

SPRING DISTRIBUTION OF HERRING LARVAE STUDIED:

M/V "Rorqual" Cruise 3-65 (May 11-21, 1965): To determine the spring distribution of herring larvae along the coast of the Gulf of Maine, and to compare the catches of herring larvae at routine sampling stations with those in areas not previously sampled were the objectives of this cruise by the research vessel Rorqual, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Boothbay Harbor, Me. The area investigated was between Grand Manan Channel and Cape Ann.



Shows area of operations during M/V Rorqual cruises 3-65 and 4-65 (May 1965).

BIOLOGICAL OBSERVATIONS: Thirty-minute oblique hauls were made at 21 stations routinely sampled, and at 28 additional positions located between them. Horizontal hauls were made at the surface and at 10 and 20 meters (32.8 and 65.6 feet), and bottom in the Saco Bay area to determine the vertical distribution of herring larvae. Except for 5 tows in the Machias area where the Boothbay Depressor No. 1 trawl was used, samples were collected with the larger Boothbay Depressor No. 2 trawl. A single oblique tow with the Gulf III trawl was made in Grand Manan Channel.

The oblique trawl tows yielded 12,407 fish larvae of which over 7,000 were herring larvae. Individual catches of herring larvae varied from 0 at a number of stations near Cape Ann to 2,046 in Saco Bay. Larvae were present at most of the stations sampled, and some of the areas that were not sampled routinely had good catches. The horizontal tows in the Saco Bay area showed that herring larvae were concentrated from the surface to 10 meters; perhaps fewer than 9 percent of the 904 larvae taken were from 20 meters and from the bottom at 45 meters (147.6 feet). Other fish larvae had a similar distribution and only one-third of the 1,397 taken were from those depths. The size range of herring larvae extended from 22 to 45 millimeters (0.9 to 1.8 inches). The size modes varied between stations but usually were positioned from 30 to 35 meters (98.4 to 114.8 feet). No herring were recorded on the echo-sounder.

HYDROGRAPHIC OBSERVATIONS: The thermograph recorder was run throughout the cruise and surface salinity and temperature was sampled at each station. Five seabed drifters and surface drift bottles were released at each station. Nansen bottle and bathythermograph casts were made in Grand Manan Channel.

M/V "Rorqual" Cruise 4-65 (May 21-26, 1965): To sample larval herring and hake environmental measurements at selected stations in the coastal areas of the Gulf of Maine was the objective of this cruise by the Rorqual. The area investigated was between Machias Bay and Cape Ann within the 50-fathom line.

BIOLOGICAL OBSERVATIONS: Oblique hauls with the Boothbay Trawl No. 1 were made at 21 stations from 20 meters to the surface at 18 stations and from the bottom to the surface at 3 stations in the central-eastern cruise sector. Oblique Gulf III trawl tows were made from 20 meters to the surface at 12 coastal continuity stations.

A total of 140 herring larvae were taken at 15 of the 21 stations in the trawl. As in the Rorqual's previous cruise, no larvae were taken in the vicinity of Cape Ann, and the size range of larvae from other stations was 24-45 millimeters (0.94-0.98 inches). The catch per unit of effort was half that of the previous cruise at stations routinely sampled. Only 13 larvae were taken in the Gulf III trawl. Surface temperatures ranged from 39.8° F. in the Machias Bay area to 55.2° F. at Cape Ann. A thermocline was present in the waters from Cape Ann to Penobscot Bay. No herring were recorded on the echo-sounder.

HYDROGRAPHIC OBSERVATIONS: Nansen bottle casts, bathythermograph casts, and photometer and secchi disc readings were made at each station. Five seabed drifters and 5 surface drift bottles were released at each station.

Note: See Commercial Fisheries Review, August 1965 p. 46.

RECORD DOGFISH CATCH OBTAINED IN SINGLE TOW:

Each groundfish survey cruise conducted by research vessels of the U. S. Bureau of



A big haul of spiny dogfish by a U.S. Bureau of Commercial Fisheries research vessel.

Commercial Fisheries Biological Laboratory, Woods Hole, Mass., occupies around 200 trawl stations. The catches of fish vary in size from a few pounds to 1 or 2 tons. On one of those cruises in April 1965, over 12,000 pounds of dogfish were taken during a single one-half hour tow. That catch, made by the Bureau's research vessel Albatross IV south of Nantucket in a depth of 100 fathoms, was the largest ever made by the vessel, and severely strained Bureau biologists who are responsible for measuring everything that is taken by the net on survey cruises. However, effective subsampling techniques were quickly used to handle the catch. It was noted that no sign of fish had appeared on the fish finder during the tow.



North Pacific Fisheries Explorations and Gear Development

HAKE POPULATION SURVEY CONTINUED:

Simulated commercial fishing for Pacific hake (Merluccius productus) for 100 days is the purpose of cruise 6 by the vessel Western Flyer. Chartered for exploratory fishing by the U. S. Bureau of Commercial Fisheries, the vessel left Seattle July 16, 1965, to fish off the coast of Washington, Oregon, and California.

Major objective of the cruise is to determine the commercial production potential of Pacific hake when fished with the experimental "Cobb" pelagic trawl and accessory equipment. Other objectives include the collection of data such as: (1) economic factors related to commercial exploitations; (2) ruggedness and reliability of experimental gear; (3) catch rates in time and space; (4) analysis of catching technique and fishing methodology; and (5) relative effectiveness of various loading and unloading methods and procedures (splitting, speed brailing, pumping, etc.).

The vessel will operate from a shore-based reduction plant. Nearby hake schools (located during prior explorations) will be fished to determine sustained production capability. Catches will be delivered to a commercial fish reduction plant when possible.

The gear to be used during the production trials include: (1) experimental "Cobb" pe-

lagic trawls; (2) aluminum hydrofoil-type otter boards; (3) electrical towing cable; (4) dual electrical depth-telemetry system; and (5) high-resolution "white-line" type echosounder.

Note: See Commercial Fisheries Review, August 1965 p. 47.



Oceanography

COAST GUARD CUTTER "NORTHWIND" TO STUDY NORTHERN WATERS:

The U. S. Coast Guard cutter Northwind left New York City on June 27, 1965, for a five-months oceanographic study to expand world knowledge of far northern waters. A good part of the expedition will be in northern waters which are relatively unexplored with marine studies scheduled in the Kara and Barents Seas north of Russia. It is expected that the expedition will supply extensive data about those important, but little known waters.



U.S. Coast Guard cutter (269 feet long) Northwind.

Marine scientists of the Coast Guard's Oceanographic Unit will carry out a variety of programs dealing with physical oceanography, geology, and geophysics, hydroacoustics, ice reconnaissance, and biology. To monitor boundary conditions affecting the circulation between the North Atlantic Ocean and the Arctic Basin, the marine researchers will carry out a physical oceanographic survey from the southern tip of Greenland to Iceland, and then on to Scotland. The scientists will occupy 23 stations and their measurements will include temperature, salinity, dissolved oxygen, and water color and transparency determinations.

Working closely with the cutter Northwind, and carrying out similar programs in the Arctic Seas will be scientists of the U. S. Naval Oceanographic Office, the University of Wisconsin, the Office of Naval Research, and the Smithsonian Institution.

This multipronged investigation of far northern waters should yield a profile of the areas studied never before available to the world's oceanographic community. As a result of the study, scientists for the first time will have important information on the nature, structure, and history of the immense Eurasian Continental Shelf. The study could shed new light upon the origin of the earth itself. Representative biological life also will be collected on the expedition.

**PROPOSED "SEA-GRANT" COLLEGES
TO BE DISCUSSED AT
UNIVERSITY OF RHODE ISLAND
CONFERENCE, OCTOBER 28-29, 1965:**

A national conference to develop plans and ideas for implementing the concept of "sea-grant" colleges will be held at the University of Rhode Island on October 28 and 29, 1965. The 2-day session will be held in conjunction with a meeting of the National Academy of Sciences Committee on Oceanography.

Among the featured speakers will be the dean of the Institute of Technology, University of Minnesota, who is credited with originating the idea. He believes that "sea-grant" colleges should be established in existing universities as "modernized parallels of the developments in agriculture and the mechanic arts which were occasioned by the land grant act of about a hundred years ago.... The same kind of imagination and foresight could be applied to exploitation of the sea."

Under the Morrill Land Grant Act of 1862, all the States were allocated Federal land to establish a college where the "leading object shall be... to teach such branches of knowledge of learning as are related to agriculture and the mechanic arts...." While Federal lands are not available today for such a purpose, it was suggested, for instance, that some of the funds the U. S. Government receives from the lease of undersea lands might be allocated to "sea-grant" colleges.

Also participating in the meeting on "sea-grant" colleges will be Senator Claiborne Pell

of Rhode Island who said he intends "within a short time" to introduce legislation concerning "sea-grant" colleges. Other educators, scientists, and Congressmen will be invited to take part in the sessions. (University of Rhode Island, Kingston, R. I., July 15, 1965.)



Salmon

U. S. PACIFIC COAST CANNED STOCKS, JULY 1, 1965:

On July 1, 1965, canners' stocks (sold and unsold) in the United States of Pacific canned salmon totaled 733,575 standard cases (48 1-lb. cans)--218,069 cases less than on June 1, 1965, when stocks were 199,236 cases less than on May 1, 1965.

On the basis of a total of 858,116 actual cases (consisting of cans of $\frac{1}{4}$ -lb., $\frac{1}{2}$ -lb., 1-lb., etc.), pink salmon accounted for 46.5 percent (399,169 cases of which 326,096 cases were 1-lb. talls) of the total canners' stocks on July 1, 1965. Next came chum (262,259 cases, mostly 1-lb. talls), followed by red (109,129 cases). The remainder of about 10.2 percent was coho (silver) and king salmon.

Table 1 - Total Canners' Stocks of Pacific Canned Salmon, July 1, 1965

Species	July 1, 1965	June 1, 1965	May 1, 1965
(No. of Actual Cases).....		
King	24,850	30,336	39,645
Red	109,129	180,128	227,847
Coho	62,709	73,724	87,255
Pink	399,169	515,796	654,421
Chum	262,259	331,956	373,892
Total	858,116	1,131,940	1,383,060

Carryover stocks at the canners' level totaled 1,175,588 standard cases on July 1, 1964, the approximate opening date of the Pacific salmon packing season. Adding the 1964 new season pack of 3,922,356 standard cases brought the total available supply for the 1964/65 season to 5,097,944 standard cases.

Shipments during June 1965 totaled 218,069 standard cases. Shipments at the canners' level of all salmon species during sales year from July 1, 1964, to July 1, 1965, totaled 4,364,369 standard cases. That resulted in a carryover of 733,575 standard cases on July 1, 1965, the beginning of the 1965/66 sales year, substantially lower (37.6 percent) than the 1,175,588 cases a year earlier.

Table 2 - Total Cannery Stocks on Hand July 1, 1965 (Sold and Unsold), By Species and Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
(Actual Cases)						
48 1/4-lb.	1,749	33,200	8,782	1,115	22	44,868
48 1/2-lb.	20,159	58,909	12,668	68,304	21,741	181,781
48 1-lb.	2,856	17,009	39,786	326,096	231,483	617,230
12 4-lb.	86	11	1,473	3,654	9,013	14,237
Total	24,850	109,129	62,709	399,169	262,259	858,116

Table 3 - Cannery Shipments From July 1, 1964 to July 1, 1965, By Species and Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
(Actual Cases)						
48 1/4-lb.	22,498	394,732	113,910	10,566	1,422	543,128
48 1/2-lb.	116,683	628,185	41,707	535,164	136,350	1,458,089
48 1-lb.	19,265	481,045	128,723	2,071,828	647,124	3,347,985
12 4-lb.	330	4,939	20,017	95,743	30,529	151,558
Total	158,776	1,508,901	304,357	2,713,301	815,425	5,500,760

The new 1965 season Alaska salmon pack totaled 2,219,299 standard cases (includes 171,859 cases of pink salmon) as of July 25, 1965. That compared with 1,585,951 cases on July 26, 1964. Most of the new pack consisted of red salmon packed at canneries in central and western Alaska.

Data on canned salmon stocks are based on reports from U. S. Pacific Coast canners who packed over 96 percent of the 1964 salmon pack. (Division of Statistics and Economics, National Cannery Association, July 26, 1965.)

Based on data submitted to the U. S. Bureau of the Census by a sample of wholesalers and warehouses of retail multiunit organizations, distributors stocks of salmon were estimated at 584,000 actual cases on July 1, 1965, and 671,000 actual cases on June 1, 1965. Data on distributors stocks for previous months are not available.



Shrimp

BREADED PRODUCTION, JANUARY-MARCH 1965:

United States production of breaded shrimp during the first quarter of 1965 amounted to about 21.3 million pounds--a decrease of about 1.4 million pounds or 6.1 percent as compared with the same period in 1964.

Table 1 - U. S. Production of Breaded Shrimp by Months, 1964-65

Month	1/1965	1964
.. (1,000 Lbs.) ..		
January	6,901	7,347
February	6,613	8,045
March	7,742	7,249
April	-	7,027
May	-	6,171
June	-	6,588
July	-	8,641
August	-	7,299
September	-	7,830
October	-	9,169
November	-	7,852
December	-	7,460
Total	-	90,878
1/ Preliminary.		

Table 2 - U. S. Production of Breaded Shrimp by Areas, January-March 1965

Area	1/Jan.-Mar. 1965		Jan.-Mar. 1964	
	No. of Plants	Quantity 1,000 Lbs.	No. of Plants	Quantity 1,000 Lbs.
Atlantic	17	7,167	14	6,415
Gulf	18	12,420	19	14,407
Pacific	7	1,669	8	1,819
Total	42	21,256	41	22,641
1/ Preliminary.				

The Gulf States ranked first in the production of breaded shrimp with 12.4 million pounds, followed by the Atlantic States with 7.2 million pounds, and the Pacific States with 1.7 million pounds.

Note: See graph on p. 23 of this issue; also *Commercial Fisheries Review*, May 1965 p. 36, Jan. 1965 p. 47.



South Atlantic Fisheries Explorations and Gear Development

FISHERY RESOURCE POTENTIALS IN SOUTHERN BAHAMA AREA EXPLORED:

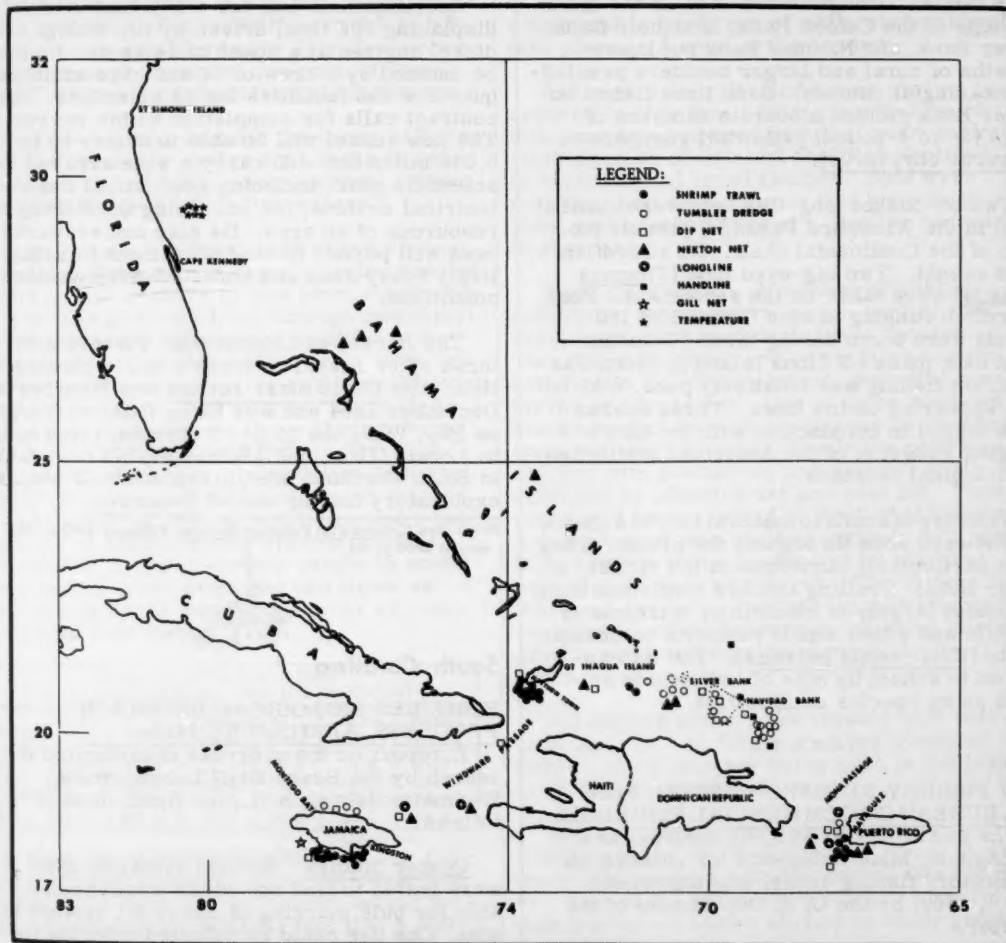
M/V "Oregon" Cruise 101 (May 10-June 17, 1965): A 40-day cruise in the southern Bahamas, Windward and Mona Passages, and along the southwest, west, and north coasts of Jamaica was completed June 18, 1965, by the exploratory fishing vessel Oregon of the U. S. Bureau of Commercial Fisheries.

Purposes of the cruise were to: (1) obtain a general preliminary idea of the resource

potentials of the little known areas traversed as a part of the overall explorations of the western Atlantic, and (2) cooperate with the United Nations Special Fund Caribbean Program in providing at-sea training to observers from Jamaica and Puerto Rico.

In addition to using trawls, dredges, and long lines, a wide variety of types of gear was used on the cruise to gain a general impression of the relative richness of the fauna, including trolling lines, neuston nets, nekton nets, dip nets, gill nets, and hand lines.

Trawling was made difficult--and in many areas impossible--by the extremely rugged



Shows area of operations during M/V Oregon cruise 101 (May 10-June 17, 1965):

nature of the bottom topography. Only in a few selected areas could trawls be used. Trawling close inshore along the southwest coast of Jamaica yielded moderate catches of small lane snapper (Lutjanus synagris) and very small numbers of pink shrimp (Penaeus duorarum). The sea bottom was smooth, and the only difficulty encountered was with "grass" clogging the net.

Trawling in a depth range of 225-360 fathoms south of Great Inagua Island yielded up to 30 pounds per 30 minutes per 40-foot shrimp trawl of the deep-water queensnapper (Etelis oculatus). Elsewhere the bottom proved to be largely corallaceous--catches were insignificant and gear damage resulted from trials. Dredges were used on the sides and tops of the Caicos Bank, Mouchoir Bank, Silver Bank, and Navidad Bank but heavy growths of coral and larger boulders precluded meaningful catches. Hand lines fished on Silver Bank yielded moderate numbers of large (3- to 4-pound) yellowtail snappers (Ocyurus chrysurus).

Two 50-basket long-line sets were made at night in the Windward Passage, just off the edge of the Continental Shelf. No swordfish were caught. Two big-eyed tuna (Thunnus obesus) were taken on the second set. Four swordfish ranging in size from 75 to 150 pounds were taken during three 50-basket night sets made off Mona Island in Mona Passage, but fishing was relatively poor, with no tuna appearing on the lines. Three sharks were tagged in conjunction with the Shark Tagging Program of the American Institution of Biological Sciences.

Numbers of small to moderate sized schools of tuna were seen throughout the cruise. They were particularly numerous in the vicinity of Silver Bank. Trolling catches confirmed them to consist largely of blackfin or mixtures of blackfin and either small yellowfin or oceanic bonito (Katsuwonus pelamis). The fish appeared to school by size of individuals as much as by species composition.

NEW FISHERY RESEARCH VESSEL FOR U. S. BUREAU OF COMMERCIAL FISHERIES:

The award of a \$1,990,000 contract to a Pascagoula, Miss., shipyard for building an exploratory fishing vessel was announced July 8, 1965, by the U. S. Department of the Interior.

The new vessel will be assigned to the Department's Bureau of Commercial Fisheries Exploratory Fishing Base in Pascagoula. The vessel is designed especially for operation in tropical waters and will play an important part in the Bureau's Tropical Atlantic Oceanography Program. This program is international in scope, involving the cooperative efforts of many countries, and requires the best vessels, equipment, and considerable diversity of scientific skills.

Primary function of the vessel will be to determine the distribution and abundance of the many fish and shellfish resources of the Gulf of Mexico and the Caribbean.

Specifications call for a 170-foot vessel displacing 906 tons, driven by two 800-hp. diesel engines at a speed of 14 knots. It will be manned by a crew of 14 and have additional quarters and facilities for 11 scientists. The contract calls for completion within two years. The new vessel will be able to cruise up to 9,000 miles and will carry a wide array of scientific gear, including acoustical and electrical devices, for assessing the fishery resources of an area. Its size and seaworthiness will permit fishing operations in relatively heavy seas and under adverse weather conditions.

The Bureau of Commercial Fisheries has three other research vessels under construction. The David Starr Jordan was launched in December 1964 and was being fitted at Sturgeon Bay, Wis.; the Miller Freeman, being built in Lorain, Ohio; and another vessel being built at South Portland, Me., to replace the Bureau's exploratory fishing vessel Delaware.

Note: See Commercial Fisheries Review, February 1965 p. 45; August 1964 p. 44.



South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, APRIL-JUNE 1965:

A report on the progress of biological research by the Bears Bluff Laboratories, Wadmalaw Island, S. C., for April-June 1965, follows:

Oyster Studies: Several synthetic dyes were tested to find one which would be suitable for bulk marking of intertidal oysters in situ. One dye could be detected coloring the

shells of oysters for 14 days in shallow areas. However, where the oysters were exposed to wave action retention time was reduced considerably and marking of oysters thus was not practical. This study will continue in hopes of finding a long-lasting marker which can be sprayed on intertidal oysters growing on the beds.

Studies on the general condition of oysters from several areas in the State were continued. Measurements to show the relationship between the internal volume of the oyster shell and the weight of the meat of the oyster were used to determine the condition factor. Fluctuations throughout the State were great, ranging from a low of 3.1 near Charleston Harbor to a high of 12.5 in Bull Bay. Pond-grown oysters at Bears Bluff were 9.8 to 9.9. These studies continue in the July-September quarter when an expanded program of sampling of oysters throughout the State is planned.

Test shells hung beneath the docks at Bears Bluff indicated that oyster spat began to set about May 19 and followed the general pattern of spatfall for South Carolina waters.

Shrimp Studies: Postlarval brown shrimp, *Penaeus aztecus*, which began to enter coastal waters in late January of this year, continued to recruit in good numbers through mid-April. These postlarvae were more plentiful in experimental tows during 1965 than in 1964, indicating a somewhat greater commercial catch for this species in June-August. By mid-April of this year many of those shrimp were $1\frac{1}{2}$ -2 inches in length, and by mid-May they averaged $2\frac{1}{2}$ - $3\frac{1}{2}$ inches. In mid-late June the average length was 4-5 inches, heads on, and some had reached commercial size and were beginning to appear on the shrimp grounds. The number of brown shrimp caught in each experimental trawl averaged two times as many during April-June of this year as compared with 1964 (table).

Average Catch Per Unit of Effort at Regular Survey Stations, 1962-1965 (April-June)						
Year	Croaker	Spot	Blue Crabs		White Shrimp	Brown Shrimp
			Immat.	Mat.		
1965	71.4	25.8	13.9	9.5	8.3	21.7
1964	151.9	65.6	15.6	29.3	-0.1	10.8
1963	146.8	42.9	12.9	18.6	0.02	34.2
1962	176.9	107.6	14.9	25.0	16.7	92.9

A good run of spawning white shrimp, *Penaeus setiferus*, occurred along the coast this spring. Mild water temperatures during the past winter, coupled with the fact that a con-

siderable population of white shrimp wintered over in coastal waters, probably was responsible to a great extent for the roe shrimp success this year. The majority of white "roe" shrimp appeared to spawn in early and mid-May, and postlarval white shrimp began to show up in plankton tows in mid-May. These small shrimp were extremely abundant during late May and early June. To date, the postlarvae have been over ten times more numerous than during the same period in 1964, and the outlook for the commercial catch of white shrimp this year is greatly improved. By late June, postlarval white shrimp entering inside waters began to decline in numbers, but a second peak of abundance may occur in July. Whether this occurs or not, the outlook is many times improved over 1963-64, and a considerable early run of white shrimp should take place in August or September.

Although both white and brown shrimp increased in abundance during April-June of this year as compared with last year, many other species of fish and shellfish declined in experimental trawl catches. Spot were less than half as numerous this year as in 1964, and croaker showed a similar decrease in abundance.

Pond Cultivation: A number of shrimp cultivation experiments, begun earlier this year, were continued during this quarter. Two one-acre ponds are being stocked with both brown and white shrimp, including postlarvae and juveniles. One of those ponds was stocked naturally with postlarvae by flooding from the nearby creek. The other pond was stocked with postlarvae and juvenile shrimp collected by plankton net and cast net. Both ponds will be harvested in the fall of the year. A $\frac{1}{10}$ -acre pond was stocked entirely with postlarval brown shrimp collected by plankton nets in February and March. The shrimp in that pond are being fed heavily with chopped crabs in an effort to learn more about shrimp growth rates and maximum productivity of ponds.

All shrimp ponds were treated with rotenone in April and May to remove unwanted fishes. Crab pots are being used in the ponds to control those predators.

Several experiments, using 12 x 12 foot concrete tanks stocked with postlarval shrimp, were continued or initiated during this quarter. Two of the tanks were stocked heavily with postlarval brown shrimp to study growth

rates in controlled conditions. One tank has been stocked with plankton collections containing white shrimp postlarvae as well as many blue crab (*Callinectes sapidus*) larvae. The purpose of this experiment is to determine whether crab larvae can survive pond conditions, and if so what effects they have on young shrimp.

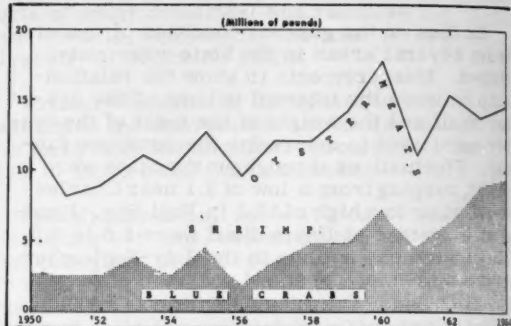
Experiments on artificial breeding of white shrimp were carried out during May and June. Several white "roe" shrimp in spawning condition were induced to spawn in tanks, and in one case a number of eggs were hatched. Although the young shrimp survived only a few hours after hatching in this experiment, the results were encouraging.

Fish Kill: Beginning May 21, 1965, another fish kill occurred in the Ashley River. It was first reported to Bears Bluff Laboratories by National Park Service personnel who noticed and collected dead and dying mullet around Fort Sumter in Charleston Harbor. Although most of the dead fish noted in the river were menhaden, inspectors of the State's Division of Commercial Fisheries also found spot, mullet, and 1 or 2 shrimp. The kill was investigated by the S. C. Water Pollution Control Authority. It continued sporadically through the end of June. In June, the U. S. Public Health Service sent in a team of investigators from Cincinnati, Ohio, and another from Athens, Ga. Bears Bluff Laboratories cooperated with them in every way and the research boat *Anita* was used to collect fish. Two trips were made to areas far removed from the Ashley River to secure control specimens, and two trips were made in the Ashley River where repeated trawling produced a large number of abnormal-appearing discolored menhaden and croaker, which were given to the Public Health Service.

FISHERY LANDINGS AND TRENDS, 1964:

Landings of fish and shellfish at South Carolina ports during 1964 were 21.7 million pounds valued at \$3.0 million--a decrease of 1 percent in quantity and 7 percent in value from 1963. Leading species during 1964 were blue crab 9.4 million pounds, spot 3.2 million pounds, shrimp 2.6 million pounds (heads-on), and oyster meats 2.5 million pounds. Those 4 species made up 82 percent of the year's total catch.

Blue crab landings were at a record level for the second straight year. Ex-vessel crab prices ranged from 3 to 5 cents a pound in 1964. With a firm market for crab meat, nearly all picking plants in South Carolina worked to capacity. Crab fishermen tended to shift to the use of pots and traps, rather than trot lines.



South Carolina landings of crabs, shrimp, and oysters, 1950-1964.

Shrimp landings were up 20 percent from 1963, but were far below the average catch of 5 to 7 million pounds of recent years. The average ex-vessel price for shrimp in 1964 was 33 cents a pound (heads-on weight), an increase of 4 cents from the previous year.

The production of oyster meats in 1964 totaled 2,511,071 pounds valued at \$996,969, as compared with 3,827,078 pounds valued at \$1,556,451 in 1963.

The catch of food finfish in 1964 was about 5 percent below 1963 due to a poor beach-net fishing season in Horry County during the fall months. Landings were down for flounder, mullet, sea bass, and pompano, but up sharply for catfish, spot, and bluefish.

A series of fish kills occurred in South Carolina waters during the year. On May 15 and for several days thereafter, a heavy kill of fiddler crabs and shrimp occurred back of the Isle of Palms. All evidence indicated that the kill resulted from the use of the chemical BHC in a mosquito abatement program. A very large fish kill took place in the Ashley River and Charleston Harbor beginning on the night of June 21. The causative agent in that kill had not been determined at the close of the year. Another fish kill of much smaller magnitude happened in the Ashley River beginning November 18.



States' Legislation

ACTIONS AFFECTING FISHERIES:

Following is a supplemental list of 1965 State laws and resolutions passed by the various State Legislatures which have already adjourned for the year. (*Information Letter*, National Canners Association, July 17, 1965.)

Florida: H. 2143 provides for uniform laws regulating the seafood and fishing industries in Franklin and Wakulla counties.

Puerto Rico: H. 10 annuls the Puerto Rico food, Drug and Cosmetics law of May 1939.



U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED:

U. S. Fishing Vessels 1/-Documentations Issued and Cancelled, by Areas, February, March, April, May 1965										
Area (home port)	February		March		April		May		January-May	
	1965	1964	1965	1964	1965	1964	1965	1964	1965	1964
	(Number)									
Issued first documents:										
New England	3	1	1	-	4	4	2	7	13	13
Middle Atlantic	2	1	-	-	-	1	2	2	5	5
Chesapeake	-	-	4	4	3	2	3	7	14	18
South Atlantic	5	5	8	6	7	1	4	4	27	21
Gulf	24	20	16	13	35	11	29	31	113	92
Pacific	9	3	18	4	13	16	30	27	76	53
Great Lakes	-	-	1	-	-	-	-	-	1	1
Hawaii	-	-	-	-	-	-	-	-	-	-
Puerto Rico	-	-	-	-	1	-	-	-	1	-
Total	43	30	48	27	63	35	70	78	250	203
Removed from documentation 2/:										
New England	5	5	3	2	6	3	3	3	18	14
Middle Atlantic	3	1	6	2	-	4	1	-	11	9
Chesapeake	4	5	1	1	2	2	6	4	14	16
South Atlantic	8	6	6	5	11	4	9	1	41	20
Gulf	10	11	13	8	8	13	3	6	40	47
Pacific	3	8	10	20	8	19	8	15	37	69
Great Lakes	1	-	4	1	1	2	-	1	8	9
Hawaii	-	-	-	-	-	-	1	-	2	-
Total	34	36	43	39	36	47	31	30	171	184

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.

Source: "Monthly Supplement to Merchant Vessels of the United States," Bureau of Customs, U. S. Treasury Department.

Maine: H. 94 relates to the license for sardine packers. H. 95 repeals the law regulating the canning of herring. H. 848 repeals the sardine tax on exports. S. 293 repeals the Fish Packing Wage Board Law. S. 526 revises the minimum wage law.

North Carolina: H. 560 rewrites the laws relating to the conservation of marine and estuarine and wildlife resources. H. 862 authorizes the State board of health to make and enforce regulations concerning the sanitary aspects of harvesting, processing, and handling shellfish and crustacea, including the power to issue and revoke permits.

New York: A. 4320 requires that the State sanitary code shall prescribe procedures for the testing of the atmosphere, potable waters, cultivated soil, plant and animal life grown or raised for food, and all food and food products, to determine the level of radioactivity.



U.S. Foreign Trade

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-July 3, 1965, amounted to 19,159,835 pounds (about 912,400 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. That was a gain of 7.7 percent from the 17,793,706 pounds (about 847,300 standard cases) imported during January 1-July 4, 1964.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1965 at the 12½-percent rate of duty is limited to 66,059,400 pounds (or about 3,145,685 standard cases

United States market and in 1964 accounted for 59 percent of the total imports of that product. Iceland has been the second important supplier of frozen fish blocks, followed by Norway, Greenland, Iceland, Denmark, and West Germany.



Virginia

RESULTS OF RESEARCH DISCUSSED AT NATIONAL SHELLFISH ASSOCIATION MEETING:

The seasonal behavior of MSX in destroying oysters in Virginia was described by the Senior Marine Scientist of the Virginia Institute of Marine Science to the assembled oyster biologists from the entire coastal area of the United States at their annual National Shellfisheries Association meeting in Baltimore, Md., in June 1965.

Along with a thumbnail sketch of periods when mortalities of oysters are most likely to occur, he presented a graph showing the sequence of infections and death rates in disease-free oysters imported from November to June into MSX-infested areas. Some 40 percent of the seed oysters planted in such areas will die before winter and as high as 90 percent will be dead at the end of three years, according to the Institute scientist. He pointed out that on the other hand, if seed oysters are planted in MSX-infested waters after August 1, they become infected but deaths do not occur until the following June. Only short-term storage or holding of oysters is possible in MSX-infested areas.

Institute scientists said that in summer 1964, large numbers of offspring from brood stock which had survived several years in heavily-infested water were successfully raised to seed size--about 2 inches. That seed will be exposed to MSX for several years to eliminate susceptible oysters. The survivors will become parents of the next generation and should exhibit considerable resistance to MSX.

Papers presented by Institute scientists at the meeting included one on two clams found in marine waters, "Larval Development of *Rangia cuneata* and *Lyonsia hyalina*"; others were "Salinity Tolerance Limits of Some Species of Pelecypods from Virginia"; and "A Program in Virginia for Breeding MSX

Resistant Oysters by Hatchery and Pond Methods," given at a joint session of oyster biologists and oyster growers. (Virginia Institute of Marine Science, Gloucester Point, June 29, 1965.)

Note: See Commercial Fisheries Review, July 1965 p. 43; September 1964 p. 36.



Wholesale Prices

EDIBLE FISH AND SHELLFISH, JULY 1965:

Because prices for fresh finfish generally increased from June to July 1965, the wholesale index for edible fishery products (fresh, frozen, and canned) at 109.8 percent of the 1957-59 average rose 0.8 percent. Compared with July 1964, the overall index this July was up 3.0 percent because of higher prices for nearly all items. July 1965 prices were substantially higher than a year earlier for many fresh and frozen fishery products and some canned fish products in short supply.

The subgroup index for drawn, dressed, or whole finfish was up 5.0 percent from June to July because of higher prices for nearly all items. At New York City, wholesale prices were up for western fresh halibut by 14.3 percent as a result of light supplies; western fresh king salmon by 3.6 percent; and Great Lakes round yellow pike by 13.5 percent. At Boston, ex-vessel large haddock prices were up 3.6 percent. But Lake Superior whitefish prices at Chicago were down 4.9 percent. As compared with July 1964, the subgroup index this July was higher by 3.6 percent. Except for salmon, prices were up from a year earlier for all items--25.0 percent for fresh halibut, 3.2 percent for ex-vessel haddock, 22.5 percent for Great Lakes yellow pike, and 11.5 percent for whitefish.

Although July 1965 prices for fresh haddock fillets at Boston were up 12.8 percent from the previous month, they were offset by a price drop (down 3.4 percent) at New York City for South Atlantic fresh shrimp. This brought the fresh processed subgroup index down 0.9 percent. July 1965 prices for shucked standard oysters were unchanged for the 3-month period since May. Compared with July 1964, the subgroup index this July was up 2.9 percent. Prices were higher for all items, but the greatest increase was for haddock fillets (up 16.0 percent).

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, July 1965 with Comparisons								
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			July 1965	June 1965	July 1965	June 1965	May 1965	July 1964
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					109.8	108.9	109.2	106.6
<u>Fresh & Frozen Fishery Products:</u>					112.8	111.5	112.9	109.3
<u>Drawn, Dressed, or Whole Finfish:</u>					119.0	118.3	106.1	114.9
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.12	.11	91.4	88.2	74.0	88.6
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.50	.44	147.9	129.4	119.8	118.3
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.90	.87	125.8	121.4	115.3	129.2
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.69	.62	87.3	91.8	86.6	78.3
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.63	.55	102.3	90.1	106.4	83.5
<u>Processed, Fresh (Fish & Shellfish):</u>					108.6	109.6	118.9	105.5
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.40	.36	97.2	86.2	80.2	83.8
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.86	.89	100.8	104.3	123.0	98.4
Oysters, shucked, standards	Norfolk	gal.	7.13	7.13	120.2	120.2	120.2	118.0
<u>Processed, Frozen (Fish & Shellfish):</u>					105.7	106.6	109.4	102.5
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	97.6	98.8	98.8	95.0
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.37	.37	108.5	108.5	109.9	108.5
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.32	.30	112.2	105.2	105.2	108.7
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.88	.89	103.7	105.5	109.7	99.0
<u>Canned Fishery Products:</u>					104.9	104.9	103.0	102.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	22.00	22.00	95.9	95.9	91.5	97.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.56	11.56	102.6	102.6	102.6	102.1
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.13	7.13	120.9	120.9	120.9	105.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	10.25	10.25	131.5	131.5	131.5	113.0
1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.								

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

The July 1965 subgroup index for processed frozen fish and shellfish was down 0.8 percent from the previous month. While prices for frozen ocean perch fillets rose 6.7 percent, those for frozen shrimp at Chicago dropped 1.7 percent and for other species of frozen fillets were slightly lower or unchanged from a month earlier. But prices this July were mostly higher than in the same month of 1964, with the subgroup index up 3.1 percent.

July 1965 prices for canned fishery products held at the same level as in the previous month. Market conditions for canned fish

items in the subgroup were better than steady, with some indication of firming because of the light seasonal pack for some products. The new Maine sardine canning season was off to a slow start but improved toward the end of July when the new pack exceeded that for the same period in 1964. (The total 1964 pack was disappointing, however, and much less than in 1963.) The subgroup index this July was up 2.6 percent from the same month a year earlier. Prices were higher for canned Maine sardines (up 16.4 percent) and California jack mackerel (up 14.2 percent). Canned tuna prices were slightly higher than in July 1964 and those for canned salmon slightly lower.





FOREIGN

International

INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

FISHING REGULATIONS ADAPTED TO PROTECT EARLY RUNS OF SOCKEYE SALMON TO FRASER RIVER:

As of mid-July 1965, all sockeye salmon runs to the Fraser River were both earlier and lighter than those in the brood year of 1961. Normally, the 1965 Fraser River sockeye runs should be later than those of the preceding cycle.

Early arrival of salmon on spawning grounds has been associated with some pre-spawning mortality. Therefore, when the Horsefly run of sockeye salmon to the Fraser River arrived early, the International North Pacific Salmon Fisheries Commission granted both United States and Canadian fishermen 24 hours of additional fishing for the week commencing July 18, 1965. However, to provide for adequate escapement, the Commission ruled that no fishing in Convention waters would be allowed in the last week of July until a satisfactory number of the Horsefly run has passed above the fishing boundary in the Fraser River.

GREAT LAKES FISHERY COMMISSION

10TH ANNUAL MEETING:

Lake trout continue to recover in Lake Superior, according to scientists attending the 10th annual meeting of the Great Lakes Fishery Commission, held at Ann Arbor, Mich., June 22-24, 1965. The improvement in recovery is attributed to the 80-percent reduction in sea lamprey populations and the planting of hatchery-reared lake trout to supplement natural spawning in inshore areas.

Canadian and United States scientists carrying out the program reported that all but two of the sea lamprey-producing streams in Lake Superior has been chemically treated

at least once and more than half were treated twice. Although the reduction in sea lampreys was substantial, they were still present in significant numbers in certain isolated areas and possible sources of this continuing infestation were discussed at the meeting. It was agreed that several "problem" streams should be investigated intensively.

Substantial annual plantings of hatchery yearling lake trout are contributing to the fish stocks. An improved natural spawning was noted in the fall of 1964 for the first time since 1959, but it cannot be expected to provide a significant increase in numbers of adult fish for 5 years.

Distinct lake trout populations have been found on isolated offshore grounds which have not been as severely affected by sea lampreys as those near shore. Those grounds are now in a healthy condition and scientists have recommended that they be fished on an experimental basis.

The chemical treatment program which began in Lake Michigan in 1960 has proceeded on schedule and should be completed in June 1966. This past spring, Lake Michigan received its first substantial lake trout planting (1.2 million fish). They were planted in Grand Traverse Bay, off the east shore of Wisconsin's Door Peninsula, along the north shore and in the reef-studded area around Beaver Island.

The Commission's chairman, Donald L. McKernan, Director, U. S. Bureau of Commercial Fisheries, expressed concern at the deterioration of conditions in Lake Erie, once the major commercial producer of freshwater fish on this continent. In 1955, the Lake Erie catch was 75 million pounds valued at \$9.6 million. In 1964 the catch from that lake was down to only 38.7 million pounds and the value dropped to \$3.6 million. Investigations in Lake Erie have barely been able to follow the changing fish populations and food organ-

International (Contd.):

isms resulting mainly from pollution. According to the Commission's chairman, the decline in preferred species in Lake Erie is continuing at such a rapid rate that a reappraisal of the situation should be made and a new approach taken in dealing with its problems. (University of Michigan News Service, June 24, 1965.)

Note: See Commercial Fisheries Review, September 1964 p. 52.

INTERNATIONAL CONVENTION FOR THE NORTHWEST ATLANTIC FISHERIES

WEST GERMANY ADHERES TO PROTOCOL CONCERNING HARP AND HOOD SEALS:

On May 26, 1965, the Federal Republic of Germany deposited adherence to a Protocol to the International Convention for the Northwest Atlantic Fisheries of February 8, 1949. The Protocol (done at Washington, July 15, 1963) relates to harp and hood seals and is intended to bring those species within the responsibility of the Northwest Atlantic Fisheries Commission. The Protocol is not yet in force. (Bulletin, U. S. Department of State, June 14, 1965.)

Note: See Commercial Fisheries Review, March 1964 p. 45.

FOOD AND AGRICULTURE ORGANIZATION

PRELIMINARY DRAFT CONVENTION FOR THE CONSERVATION OF ATLANTIC TUNA:

A Working Party of the Food and Agriculture Organization (FAO) agreed July 13, 1965, on a draft international convention for the conservation of Atlantic tuna. The draft will now go before the Conference of FAO which meets in November 1965.

The Working Party has asked the FAO Conference to convene a conference of nations early in 1966 to adopt an Atlantic Tuna Convention. The Government of Brazil has offered to host such a meeting, which might be held in April 1966 at Sao Paulo.

FAO officials point out that there has never been any international action for the protection of Atlantic tuna stocks. Atlantic tuna are fished by many nations and yield an average catch of 300,000 metric tons a year.

The draft convention approved by the FAO Working Party covers the Atlantic Ocean and such adjacent waters as the Caribbean, the Gulf of Mexico, and the Mediterranean. It would set up a new international commission

to deal not only with research but also with recommendations to protect the stocks. It would work in close cooperation with FAO. The commission would be open to all interested member nations of the United Nations and its specialized agencies.

A delegate from Brazil was Chairman of the Working Party Session, July 6-13, 1965. Other delegates attended from France, Japan, Nigeria, Portugal, Senegal, and the United States, together with observers from Cuba, the Federal Republic of Germany, Mexico, and Italy. (Food and Agriculture Organization of the United Nations, Rome, July 13, 1965.)

* * * * *

GLOBAL REGULATION OF WHALING URGED:

Whaling must be regulated at a worldwide level as soon as possible, declared the chief of the Fisheries Biology Branch of the Food and Agriculture Organization (FAO) at the 17th annual meeting of the International Whaling Commission. The most pressing need, according to FAO officials, is the control of whaling from motherships.

In speaking of global whaling regulations, FAO's Fishery Biology chief said, "This is now very urgent in view of the need to establish, without reasonable doubt, the levels of sustainable yield of each species in the seasons 1966/67 and 1967/68, and pave the way for a long-term regime of regulation which will ensure the attainment as soon as possible, by these stocks, of levels at which they can sustain maximum yields."



Fig. 1 - Japanese whaling factoryship in Bering Sea.

Referring to the unanimous decision of the International Whaling Commission to restrict whaling quotas during coming seasons, he continued, "We must remember that the price of unanimity in the agreement... was a concession permitting continued overfishing of the sei and fin whale stocks for a further two seasons. We know that this most unfortunate situation was reached because heavy investments were made in new whaling expeditions notwithstanding the warnings of many scientists over many years that the stocks could not stand such hard exploitation."

At a special conference held in London in May 1965, the Commission recommended a limit of 4,500 blue-whale units for the 1965/66 Antarctic season. In the preceding season (1964/65), the whaling nations took 7,000 units. The Commission recommended that quotas should be further reduced for the 1966/67 and 1967/68 seasons, so that by then the catch would be less than the combined sustainable yield of the stocks of fin and

International (Contd.):

sei whales. (The whaling industry counts its catch in blue-whale units, one of which equals 2 fin whales or 6 sei whales.) It was pointed out that for years quotas were set far above safe yields, on the grounds that this was economically necessary. Yet most expeditions failed to catch enough whales to justify the high investments.

FAO's Fishery Biology chief said, "Now, the residual stocks will have to bear the brunt of a last-minute attempt to recuperate some of the losses on what turned out to be bad investments. We have to accept this situation and the means now agreed to get out of the dilemma—but we cannot be happy with it. Let us at least learn some lessons from the history of the industry—to develop other fishery industries on the basis of scientific appraisals of the capacity of renewable resources to yield continuously: to take due account, in due time, of the scientific advice."



Fig. 2 - Removing flukes and flensing whale aboard a Japanese factoryship in Bering Sea.

The FAO spokesman said his organization urged taking advantage of the next two years to make a full appraisal of all available whale stocks, especially of the remaining sperm and blue whales. He pledged FAO's full cooperation in resolving all outstanding questions related to world whaling. If whaling was to survive as a major industry, he said, FAO believes that one immediate need is the establishment of an international observer system to check on observance of the new whaling quotas. (Food and Agriculture Organization, Rome, June 29, 1965.)

INTERNATIONAL WHALING COMMISSION

17th ANNUAL MEETING HELD:

The opening session of the 17th annual meeting of the International Whaling Commission, held in London June 28-July 2, 1965, was addressed by the Minister of State for Scotland. He said that at the present time the Antarctic whaling industry was confronted by great difficulties because conservation schemes have not yet been sufficient to maintain the whale stocks at a satisfactory level. Conservation demands immediate sacrifices if whaling is to survive and give an economic return. The agreement at the Commission's Special Meeting in May 1965 that the Antarctic catch limit should be reduced to 4,500 blue-whale units for the next season (1965/66) and that reductions should be made in the following two years to a level which will allow the stocks to recover is a very gratifying one. He concluded by saying that he hoped all concerned would accept the full

implications of the situation and support the further reductions necessary if the stocks are to be rebuilt from their present depleted conditions and that the foundations of a prosperous future might be laid.

A total of 15 expeditions (7 Japanese, 4 Soviet, and 4 Norwegian) operated in the Antarctic in the 1964/65 season and caught a total of 20 blue whales, 7,308 fin whales, and 19,874 sei whales for a total of 6,986 blue-whale units (1 blue-whale equals 2 fin or 6 sei whales). In addition, those expeditions caught 4,211 sperm whales in the Antarctic. In the previous season there were 16 expeditions (7 Japanese, 4 Norwegian, 4 Soviet, and 1 Dutch) which caught a total of 112 blue whales, 13,870 fin whales, 2 humpback whales, 8,286 sei whales amounting to 8,429 blue-whale units in all, and also 6,651 sperm whales. The total production of baleen and sperm oil from the 1964/65 Antarctic pelagic season amounted to 1,158,841 barrels (1 barrel equals about $\frac{1}{2}$ metric ton); this compared with a production of 1,299,476 barrels from the 1963/64 catch.

Two Antarctic land stations at South Georgia were operated by Japanese whaling companies in 1964/65, catching a total of 1,150 whales (503 fin, 506 sei and 141 sperm) yielding 45,806 barrels of oil. That compares with a total of 1,021 whales taken from those two land stations in 1963/64 from which 41,282 barrels of oil were produced. Outside the Antarctic, 36 land stations and 7 factoryships operated in 1964, and a total of 28,527 whales were taken (256 blue, 4,731 fin, 316 humpback, 4,986 sei, 18,054 sperm, and 184 other species). In addition, the Antarctic pelagic expeditions caught 4,316 sperm whales on their way to the Antarctic bringing the total catch outside Antarctic waters to 32,843 whales. Total oil production amounted to 882,159 barrels. Comparable figures for 1963 were 33,433 whales (including 3,659 sperm whales taken by Antarctic pelagic expeditions north of 40° South latitude) and 925,045 barrels of oil.

The regulations of the International Convention for the Regulation of Whaling are contained in a document called the Schedule which is amended from time to time by the Commission. The amendments come into force after 90 days from the date of their notification to the Contracting Governments. If an objection is received within that period, the amendment does not become effective for another 90 days. Any other Contracting Government may object during that time, or before the expiration of 30 days from the date of receipt of the last objection received during the additional 90-day period, whichever date shall be the later. Thereafter the regulation becomes effective for all Contracting Governments who have not objected.

At the 17th Annual Meeting the Commission agreed on several amendments of the Schedule. No quota of blue-whale units for the 1964/65 season in the Antarctic had been agreed upon at the 16th Meeting, but at the Special Meeting in May 1965, Commissioners had agreed to recommend to their Governments that the quota for the 1965/66 Antarctic season should be 4,500 blue-whale units and that further reduction should be made in the 1966/67 and 1967/68 seasons so that the quota for the 1967/68 season would be less than the combined sustainable yields of the fin and sei whale stocks as determined on the basis of more scientific evidence. At the 17th meeting this recommendation of the Special Meeting was implemented by an amendment of the Schedule which was proposed by the Commissioner for the United Kingdom and seconded by the Commissioner for Canada. The amendment was to delete in Paragraph 8 (a) the

International (Contd.):

words "10,000 blue-whale units in 1963/64" and add "4,500 blue-whale units in 1965/66. There shall be further reductions for the years 1966/67 and 1967/68 that will assure that the total catch for 1967/68 will be less than the combined sustainable yields of the fin and sei stocks as determined on the basis of more precise scientific evidence." On being put to the vote, all 12 Commissioners present at the meeting were in favor of the amendment.

The Commission agreed without dissent that in Paragraph 4 of the Schedule it would be forbidden to kill blue whales in the Pacific ocean and its dependent waters north of the equator for 5 years beginning with the 1966 season. The proposal was made by the Commissioner for Canada and seconded by the Commissioner for the United States. Also in the Pacific, it was proposed by the Commissioner for Japan and seconded by the Commissioner for Australia that it would be forbidden to kill humpback whales for the 1966 season in the North Pacific ocean and its dependent waters north of the equator. This amendment of Paragraph 4 of the Schedule was carried without dissent.

Concern was expressed about the increased taxation of the stocks of sperm whales. There had been much larger catches in the last year and it was feared that decreased whaling in the Antarctic might divert more factoryships to hunt that species in the area outside the Antarctic where the females and breeding stocks are found. Furthermore, while the minimum size limits of a 38-foot length should be enough to save the great majority of females, massive evidence was available to the Commission to show that this regulation was being broken on a large scale. Although much more information is needed on the state of the stocks of that species, it was pointed out that delaying conservation action until better evidence on depletion is obtained has already shown us examples of having waited until the sustainable yield is no longer economic.

With these arguments before it the Commission therefore considered a Schedule amendment moved by the Commissioner for Australia and seconded by the Commissioner for New Zealand which stated "It is forbidden to use a whale catcher attached to a factoryship for the purpose of killing or attempting to kill sperm whales in the waters between 40° South latitude and 40° North latitude." The amendment was carried by 7 votes to 2 but there were 4 abstentions.

One paragraph in the Schedule to the Convention gives the number of blue-whale units caught in the Antarctic after which daily records of catches must be sent to the Bureau of International Whaling Statistics at Sandefjord, Norway, so that the latter can indicate to the factoryships the day when the total quota will have been reached and they must cease operations. At present the number refers to the quota for 1963/64 and stands at 9,000. For the future, however, it was proposed by the Commissioner for Australia and seconded by the Commissioner for Japan that Paragraph 8(c) of the Schedule should be changed to delete the "9,000" in the third from last line and replace it by the words "85% of whatever total catch limit was imposed by the Commission." The proposal was accepted by all Commissioners present.

In connection with other provisions of the Schedule which were on the Commission's agenda, no action was

taken. This means that for the next Antarctic season the Sanctuary area will remain open and the dates for starting and ending the baleen whale seasons remain the same.

The International Observer Scheme was the subject of a proposal by the Norwegian delegation amended by the Japanese delegation and adopted by the Commission. This drew attention to the agreement made in 1963, its nonimplementation, and the fact that it expires after the 1965/1966 season. It strongly requested the countries concerned to operate it in the forthcoming season and invited each of the active pelagic whaling nations to give a firm assurance at the 17th Meeting to the effect that they would put the scheme into operation in the 1965/66 season in accordance with the rules for the implementation of the International Observer Scheme agreed upon among the 5 countries concerned in Sandefjord on June 26, 1964. Two of the active pelagic whaling nations were able to give this assurance but the Soviet delegation stated that while they were in favor of implementation of the Scheme in the coming season their assurance must be qualified by the reserve that both the quota of the whale catch and the International Observer Scheme should be extended both to factoryships and to all land stations catching Antarctic whales and that to implement the International Observer Scheme it is necessary to solve on a just basis the problem of reallocation of national quotas between the countries concerned. It appears that talks on these matters will be continued but no solution of these problems had been worked out by the end of the Commission's Meeting.

The Commission noted that the catching of Antarctic whales from land stations south of 40° South latitude as well as in other areas of the Southern Hemisphere has increased its importance in the light of the recent situation of whale stocks in the Antarctic. They thought it desirable to set up a special group representing member countries concerned with those land stations to bring into order the catching of whales in those places and to study the setting up of an observer scheme applicable to them. The group should make appropriate suggestions and recommendations for discussion at the 18th Meeting of the Commission.

It was agreed that the Commission shall determine the total catch limit of Antarctic pelagic whaling for the 1966/67 season after taking into consideration the catch of Antarctic whales from the land stations mentioned in the previous paragraph. The Commission also invited the Governments concerned with land stations to take domestic measures on a voluntary basis so that the level of catch for the forthcoming season does not exceed that in the 1964/65 Antarctic season or the average (calculated in blue-whale units) of the catches over the last three seasons, 1963, 1964, and 1965 outside the Antarctic as the case may be.

To countries at present discussing the problems of national quotas, the Commission recommended that for the 1966/67 and 1967/68 seasons they take into consideration the catches of Antarctic whales from land stations situated south of 40° South latitude as well as in other areas of the Southern Hemisphere.

Although the taking of blue whales in the area south of 40° South latitude is forbidden, this provision in the Schedule was objected to after the 16th Meeting by all the Antarctic pelagic whaling countries. The result is that the blue whales are still not protected in Antarctic waters north of 55° South latitude from 0° eastward to 80° East longitude. The Commission therefore agreed

International (Contd.):

at this meeting to an appeal being sent to the the Antarctic pelagic countries to withdraw their objection to the change in the Schedule 6(3) brought about by the deletion of the words "except in the waters north of 55° South latitude from 0° eastwards to 80° East longitude."

In view of the Scientific Committee's views on the threat to the whale stocks in the North Pacific area where, for instance, against a catch of 3,991 fin whales in 1964 there was an estimated sustainable yield of 1,600, the Commission considered that the 4 North Pacific countries should meet immediately after the meeting to discuss conservation measures to be taken. It was also agreed that a Sperm Whale Sub-Committee should meet either just before or just after the North Pacific Working Group which should assemble as soon as possible after the 1965 season.

The Commission considered that, in view of the offer of the Director-General of the Food and Agriculture Organization (FAO) to help in a cooperative program of stock assessment in connection with Antarctic and other whales, provided adequate conservation plans were in train, the Secretary should be asked to resume arrangements similar to those intended at the time of the last meeting.

The countries party to the Arrangements for the Regulation of Antarctic Pelagic Whaling of 1962, represented by their Commissioners, met together before and during the 17th Meeting to discuss proposals for the allocation of national quotas but had not been able to conclude these discussions by the end of the meeting.

On the proposal of the Commissioner for Australia, seconded by the Commissioner for the United States and with the approval of the Commissioners present, it was agreed that the Commission should appeal to Chile and Peru to adhere to the 1946 Convention for the Regulation of Whaling. In the meantime they should be asked to observe the minimum lengths applying to sperm whales and continue to supply completed statistical data to the Bureau of International Whaling Statistics.

Present at the 17th annual meeting were Commissioners and delegates of Contracting Governments from Argentina, Australia, Canada, Denmark, France, Iceland, Japan, Mexico, the Netherlands, New Zealand, Norway, South Africa, United Kingdom, United States, and the Soviet Union. Observers also attended from Chile, Italy, Portugal, Peru, the Food and Agriculture Organization of the United Nations, the International Council for the Exploration of the Sea, and others. (Press release of International Whaling Commission, London, July 7, 1965.)

Notes: See *Commercial Fisheries Review*, July 1965 p. 59; September 1964 p. 54.

FISH MEAL

PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY-APRIL 1965:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Chile, Angola, Iceland,

**Table 1 - Exports of Fish Meal by Member Countries
of the FEO, Jan.-Apr. 1965**

Country	April		Jan.-Apr.	
	1965	1964	1965	1964
. . . (1,000 Metric Tons). . .				
Chile	9.5	10.1	40.7	53.0
Angola	3.5	2.6	19.7	15.9
Iceland	4.8	8.7	32.1	40.5
Norway	17.5	24.1	60.0	77.8
Peru	163.1	142.4	627.9	532.1
So. Africa (including S.-W. Africa) . . .	24.0	18.1	66.4	62.7
Total	222.4	206.0	846.8	782.0

**Table 2 - Production of Fish Meal by Member Countries
of the FEO, Jan.-Apr. 1965**

Country	April		Jan.-Apr.	
	1965	1964	1965	1964
. . . (1,000 Metric Tons). . .				
Chile	3.7	13.3	37.5	60.8
Angola	2.3	2.7	15.6	17.6
Iceland	4.4	10.1	27.2	31.1
Norway	23.2	31.5	79.2	74.8
Peru	149.9	158.8	658.2	654.4
So. Africa (including S.-W. Africa) . . .	37.6	32.8	111.9	96.6
Total	221.1	249.2	929.6	935.3

Norway, Peru, and South Africa/South-West Africa.

Peru accounted for about 74 percent of the 846,800 metric tons of fish meal exported by FEO countries in January-April 1965.

CODEX ALIMENTARIUS COMMISSION

COMMITTEE ON FOOD HYGIENE HOLDS SECOND MEETING:

In connection with work to develop international food standards, the Expert Committee on Food Hygiene held its second meeting, June 14-16, 1965, in Rome, Italy. The Committee, which is under the chairmanship of the United States, is one of the working groups of the FAO/WHO Codex Alimentarius (Food Standards) Commission. Food hygiene is included in the program because that element is essential to insure a food standard that is both effective and acceptable.

The Rome meeting of the Food Hygiene Committee was attended by delegates from Australia, Canada, Cuba, Denmark, France, Israel, the Netherlands, New Zealand, Poland, Sweden, Switzerland, the United Kingdom, and the United States.

The purpose of the meeting was to discuss: (1) the terms of reference of the Committee,

International (Contd.):

(2) reports of subcommittees appointed at the first meeting of the Committee (held May 27-28, 1964, in Washington, D. C.), and (3) new work assignments.

The extent of the Hygiene Committee's authority was a major point of discussion during its first meeting. At issue was the relation of the Hygiene Committee to the various Codex Committees on standards for individual commodities. Clarifying directives of the parent Codex Commission were reported at the opening of the second meeting of the Hygiene Committee. Under those directives, the Hygiene Committee may consider specific hygiene requirements when requested by a Commodity Committee, or on its own initiative where no Commodity Committee has been established. The Hygiene Committee may also consider hygiene matters if, in its expert opinion, such matters have not been adequately covered by a Commodity Committee. Although a Commodity Committee is not required to refer hygiene matters to the Hygiene Committee, the former must inform the latter when hygiene matters are being considered.

During the discussion on jurisdiction, the Hygiene Committee decided to request a widening of its authority so that it might examine all hygiene aspects of a commodity as far back as initial production if relevant to standards for the final product.

After considerable discussion, the Hygiene Committee approved a revised draft of General Principles and Guidelines for Food Hygiene Standards. It will be submitted to member Governments for comments, before being prepared in final form at the next meeting of the Committee.

A draft of hygiene standards for fish and fish products was not presented at the meeting. The United Kingdom, which had been assigned that task, reported that the draft standards would be ready for submission at the next meeting. During the discussion, a question arose as to the definition of fish products. An FAO representative said the term as it related to the work of the Hygiene Committee covered fish and crustacea, but not molluscs. To fill the gap, the United Kingdom, with the United States and Canada as collaborators, was assigned the responsibility of preparing draft hygiene standards covering all aspects of the production and processing of molluscs.

Reports by the Netherlands on salmonella and aflatoxin were reviewed briefly. The Committee decided that salmonella should be separately considered as it related to the development of hygiene standards for specific commodities. The Committee postponed a consideration of the aflatoxin problem until the results of additional research are available.

The only specific new work proposal for the coming year involving fish was the assignment for the drafting of standards for molluscs. Fish may be indirectly involved in the preparation of a report on special standards for developing countries. In addition, a report on standards for fish processing plants will be revised during the year.

The third annual meeting of the Hygiene Committee will probably be held in May or June 1966. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, July 7, 1965.)

Note: See *Commercial Fisheries Review*, Dec. 1964 p. 76, and Sept. 1964 p. 1.



Australia

DEVELOPMENT OF COMMERCIAL SHRIMP FISHERY PROMISING:

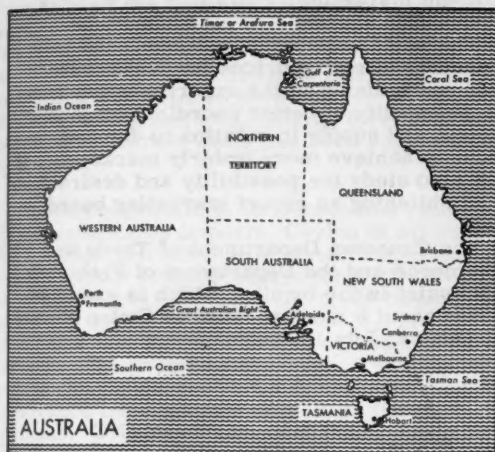
Hopes for the establishment of a commercial shrimp fishing industry in the Gulf of Carpentaria have been strengthened by continued good shrimp catches by the Australian Government's chartered survey vessel *Rama*, and three other trawlers working in that area. The survey is being supervised by a committee made up of representatives of the Commonwealth Department of Primary Industry, the Commonwealth Scientific and Industrial Research Organization, and the Queensland Department of Harbours and Marine.

Encouraged by promising catches in April and early June 1965, the Commonwealth and Queensland Governments have decided to extend the survey until August.

On April 14, the *Rama* and another vessel each caught nearly 3,000 pounds of banana shrimp (*Penaeus merguensis*) in single drags but lost most of them through gear breakage. On May 31, the same two vessels landed 5,000 pounds of shrimp. This was followed early in June by 4 vessels taking between them 10,000

Australia (Contd.):

pounds of banana shrimp in a morning. Two of the vessels had arrived in the Gulf a few days previously and were unfamiliar with local conditions. Individual drags varied from 200 to 2,000 pounds of banana shrimp.



The catches were made in the southeastern section of the Gulf, about 30 miles from Karamba, at the mouth of the Norman River where a shrimp-processing plant has been established by a Sydney food exporting firm.

Bad weather prevented fishing for a while but one of the smaller vessels managed to get out for a brief period and caught so many banana shrimp in a small net on its second trial haul that the gear broke and all but 100 pounds of shrimp were lost.

Close cooperation of the fishing industry and government has been a feature of the survey and the explorations have been narrowed down to a point where the survey team can indicate with some confidence areas of greatest probability. (Australian Fisheries Newsletter, July 1965.)

Note: See Commercial Fisheries Review, August 1965 p. 67, and April 1965 p. 57.

CONTRIBUTES FUNDS TO START FISH FARMING IN PHILIPPINES:

The Australia Freedom From Hunger Campaign organization will contribute £65,945 (US\$147,717) over a three-year period for a project designed to set up fresh-water fish

nurseries in the Philippines so as to provide the population with a source of protein food. A five-year plan has been drawn up to establish 10 fresh-water nurseries, 20 brackish-water nurseries, and 16 oyster farms. Experts will be trained to give demonstrations which will show Philippine farmers the possibilities of starting fish culture on farms.

The Australian Freedom from Hunger Campaign Committee will also support a Catholic Overseas Relief project, estimated to cost £16,337 (\$36,600), which will provide needy fishermen with seaworthy fishing craft and make possible the setting up of new fishing cooperatives in the Philippines. (Australian Fisheries Newsletter, July 1965.)

FOREIGN TRADE IN MARINE OILS, FISCAL YEARS 1962/63 AND 1963/64:

Since the closure of humpback whaling after the 1963 season, Australia has been primarily an importer rather than an exporter of marine oil. In fiscal year 1963/64 (July 1963-June 1964), Australian imports of whale oil showed a gain of 59 percent over the previous year. Imports of other marine oils, with the exception of cod-liver oil, were also up substantially.

Australian Imports of Marine Oil, Fiscal Years 1962/63 and 1963/64		
Commodity	1963/64	1962/63
	. (Imperial Gallons) .	
Whale oil	653,494	410,404
Cod-liver oil (including refined). . .	86,201	95,396
Other marine oils	164,399	135,445

Australian exports of marine oil are limited and consist largely of small shipments to Pacific Island destinations. (Agricultural Attache, United States Embassy, Canberra, June 15, 1965.)

Note: See Commercial Fisheries Review, May 1965 p. 58.



Canada

FEDERAL-PROVINCIAL PRAIRIE FISHERIES COMMITTEE MEETING:

A further step toward the establishment of a regional export-sales organization for Canadian fresh-water fish products was taken in April 1965 at a meeting in Ottawa of the Federal-Provincial Prairie Fisheries Com-

Canada (Contd.):

mittee. Officials of the Federal Departments of Fisheries, Trade and Commerce, and others concerned will establish a technical group to study the feasibility of such an organization from all points of view and effect a design for consideration by both Federal and provincial governments.

The Committee also considered proposals made by subcommittees on suggested designations of grades of fish and standards of quality for the fishery products of the Prairie Provinces, the Northwest Territories, and northwestern Ontario. A report on the concept of provincial loan boards and its possible application to the Prairie Provinces was also considered. At the meeting the Committee also was given an outline of the Federal Government's Fishing Vessel Assistance Plan and the problems associated with its possible extension to the Prairie Provinces.

Another report heard by the committee was on the Federal Government's Fisheries Indemnity Plan for vessels and equipment, and it was agreed that the inland provinces should advise the Federal Government regarding their interest in extension of the plan to their fisheries.

Other matters considered at the meeting were plans for economic research in the fresh-water fisheries of Canada and development of an improved statistical system for those fisheries. Federal-provincial programs in Newfoundland were described for the benefit of the Prairie members of the Committee, and other matters discussed were information, education, and extension services.

The Committee is made up of Deputy Ministers of Federal and provincial departments concerned with fisheries. (*Trade News*, April 1965.)

NEW COMMISSION TO STUDY EXPORT MARKETING PROBLEMS OF FRESH-WATER FISHERIES:

On July 9, 1965, the Canadian Prime Minister announced the establishment of a 1-man Commission to consider and report on the export marketing problems of the fresh-water fishing industry in the Provinces of Manitoba, Saskatchewan, Alberta, and Ontario, and the Northwest Territories.

The inquiry arises out of recommendations made by the Federal-Provincial Prairie Fisheries Committee. That Committee has been studying the problems of instability of prices and demand in export trade in fresh-water fishery products, as well as means for improving returns to primary producers by more efficient marketing.

The new Commission will study the nature of factors affecting prices for fresh-water fish, particularly in the export market, and the possibility of better coordination of production and supply in relation to demand, in order to achieve more orderly marketing. It will also study the possibility and desirability of establishing an export marketing board.

The Canadian Department of Trade and Commerce and the Department of Fisheries will assist in the inquiry, which is expected to last about 6 months. (United States Embassy, Ottawa, July 13, 1965.)

LAMPREY CONTROL EXPERIMENT GROUP HEADQUARTERS RELOCATES:

The Lamprey Control Experiment Group of the Fisheries Research Board of Canada is being consolidated in larger quarters at Sault Ste. Marie, Ont., in order to increase the efficiency of its operations, Canada's Fisheries Minister announced July 8, 1965. It will involve the transfer of part of the group's staff from the board's biological station at London, Ont., to Sault Ste. Marie, a more advantageous point from which to direct the lamprey control experiment in the Great Lakes. A new building there was to be completed and the entire staff installed by the beginning of September 1965.

The Fisheries Research Board carries out Canada's share of the lamprey control work of the Great Lakes Fishery Commission, a Canadian-United States body which is attempting to control the predatory sea lamprey in the Great Lakes, where it has had serious effects on commercially valuable stocks of lake trout and whitefish. (Canadian Department of Fisheries, Ottawa, July 8, 1965.)



Ceylon

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Ceylon

UNITED STATES EXPERTS SOUGHT TO TRAIN CEYLONESE FISHERMEN:

The Government of Ceylon is establishing a Fisheries Training Institute to help develop its fisheries. Ceylon is seeking qualified personnel from the United States and other countries to staff the Institute and teach marine engineering; electrical, mechanical, and refrigeration engineering; and fishing techniques. Ceylon is particularly interested in recruiting experienced personnel to teach modern fishing methods. Hiring foreign experts on a contract basis has been suggested by Ceylon.

To supply protein to its people and relieve its dependence on imports, Ceylon is striving for a 5-fold increase in its annual fisheries catch of about 100,000 metric tons. That will be a major task. Ceylon has 75,000 fishermen operating a fishing fleet of about 20,000 vessels. But only 2,300 of those vessels are motorized. The proposed Fisheries Training Institute can play a vital role in Ceylon's move to advance from ancient to modern fishing methods.

Note: Interested persons, firms, or institutions in the United States can obtain additional information about the Institute by writing to the Ceylon Fisheries Corporation, P. O. Box 253, Colombo, Ceylon. Information may also be obtained from the American Embassy, Colombo, Ceylon.



Chile

FISH MEAL PRODUCTION CONTINUED AT LOW LEVEL IN MAY 1965:

With the anchoveta shortage continuing, Chilean fish meal production in May 1965 totaled only 4,152 metric tons--a drop of 71 percent from the 14,501 tons produced in the same month of the previous year. Chilean fish meal production in January-May 1965 amounted to 42,119 tons, as compared with 75,253 tons in the first 5 months of 1964.

The Chilean anchoveta catch in May 1965 totaled 22,347 tons and in January-May 1965 amounted to only 252,789 tons. The Chilean fish meal industry has had only a few months of good fishing during the last 2 years, and there has been a continuous shortage of anchoveta since mid-1964. The dependence of the industry on an inshore fishery has turned out to be a serious problem. (The Continental Shelf is narrow off northern Chile, so Chilean

purse seiners work close to shore. Also, since the vessels have a limited range and do not usually carry ice, they must deliver anchoveta shortly after they are caught.)

At its height, the Chilean fish meal industry employed more than 5,000 people. Unemployment in the industry is now at least 50 percent, according to conservative estimates. (United States Embassy, Santiago, July 14, 1965, and other sources.)



Denmark

POND TROUT SURPLUS LEADS PRODUCERS TO SEEK MINIMUM EXPORT PRICES:

Danish trout producers and exporters are concerned over a surplus production of trout, possibly amounting to 1,000 metric tons, despite increased exports during the first 6 months of 1965. Production has increased more rapidly than exports because the adoption of dry feeds in pellet form as a trout food has reduced mortality during the growing period from 50 percent to about 20 percent. About 700 Danish trout farms, mostly in Jutland, find the dry feeds much more uniform in quality than the raw fish used as feed in the past.

Danish Pond Trout Supply Situation, January-June 1965 with Comparisons

Trout	Exports				Production	
	Jan. -June		Year		Year	
	1965	1964	1965	1964	1965	1964
	(Metric Tons)					
Live	1,024	934	1,771	1,344	1/	1/
Fresh	2,269	1,961	3,896	3,908	1/	1/
Frozen	1,735	1,154	2,527	2,532	1/	1/
Total	5,028	4,049	8,194	7,784	8,400	8,000

1/Breakdown not available.

Market demand for Danish trout was less than the available supplies during the first half of 1965. The surplus trout were kept alive in the ponds, and frozen stocks were not much larger than normal. Although exports increased 24 percent during the first 6 months of 1965 as compared with the same period in 1964, wholesale prices for trout dropped at least 1 krone per kilo (6.6 U. S. cents per pound). Some reports indicated that the price paid trout farmers for 6- to 8-ounce round trout had dropped to as low as 24-26 cents per pound from earlier levels of 40 cents a pound.

Denmark (Contd.):

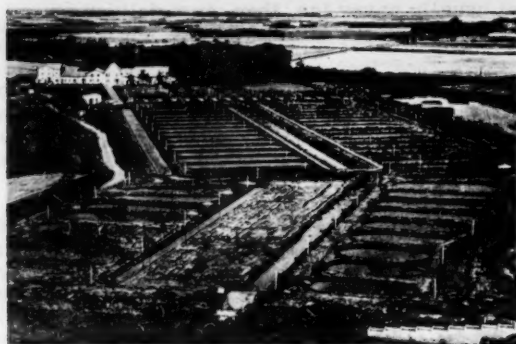


Fig. 1 - A pond trout enterprise in Denmark.

The Danish producers and exporters are seeking a solution to their surplus problem through use of a new Danish fisheries export law which became effective July 1, 1965. It permits the Danish Fisheries Minister to establish minimum prices for exports of fish and fishery products upon the request of the appropriate industry branch association and after discussion with an export committee made up of representatives of the major Danish fisheries associations. The trout producers have not had a representative association since 1961 when marketing problems disrupted the association then in existence. But they are forming a new association to be known as the Trout Producers Association of 1965 (Ørredproducentforeningen af 1965). Although the name of the new trout association mentions only "producers," it will also include exporters because practically all of them also are producers. One cooperative owned by several hundred trout farmers produces and markets about 45 percent of the Danish trout production.



Fig. 2 - Danish pond rainbow trout.

The new trout association is expected to request that minimum prices be established for pond trout exports and that a tax on those exports be collected. The funds collected would be pooled and used to: (1) promote

sales, (2) equalize prices on foreign markets, and (3) control production. Minimum export prices would be requested for all types of pond trout exports and for each market. Therefore, prices may differ for different countries. It is expected that the disparity in prices would be adjusted for producers out of the fund developed by the tax on exports. Those selling to certain markets for lower prices would be subsidized from the higher prices paid in other markets. About 80 percent of the Danish trout producers are reported to have agreed to seek minimum export prices. A meeting with the Fisheries Minister was scheduled for the week of July 19, 1965.

Exports of Danish frozen pond trout to the United States during the first 6 months of 1965 totaled 358.8 metric tons as compared with 226.1 tons during the same period in 1964. (United States Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, July 16, 1965.)



German Federal Republic

INCREASED SUBSIDIES FOR FISHING INDUSTRY ASKED BY COASTAL STATES:

Summary: In a memorandum submitted June 9, 1965, to the Federal Government, the four German coastal States (Bremen, Hamburg, Lower Saxony, and Schleswig-Holstein) said that the Government support program for the fishing industry in 1961-1964 was inadequate, and that long-term Government aid to the fishing industry is needed. Following the submission of the memorandum, the German Bundesrat (upper legislative house) approved a motion presented by a deputy from Bremen requesting increased Federal support for the German fishing industry.

The States asked the Federal Government to provide (1) DM15 million (US\$3.75 million) in fiscal year 1966 to continue ex-vessel price supports in the form of "quality premiums"; (2) DM1 million (\$250,000) during the next 2 years to continue scrapping premiums for obsolete vessels; (3) DM 5 million (\$1,250,000) a year to support export subsidies designed to remove surplus fish and stabilize domestic market conditions; (4) DM 2.5 to 3.5 million (\$625,000 to \$875,000) to aid in the construction of 8 new cutters; and (5) greater subsidization of interest rates on commercial fishery loans.

German Federal Republic (Contd.):

The four coastal States asserted that the unfavorable position of the German fishing industry is in large measure due to the expansion of fishery imports that followed tariff liberalization. The States claim that even the extensive Government support requested would afford only partial relief; a basic change in the situation cannot be achieved on a national level. Therefore, special emphasis is placed by the memorandum upon the early development of a fish-marketing order by the European Common Market (EEC).



Fig. 1 - One of the older trawlers in the German fishing fleet.

Review of Previous Federal and State Support for Fisheries: Summarizing the 3-year support program of the German Federal Government carried out during 1961-1964, the memorandum of the coastal states noted that the program provided scrapping premiums for obsolete vessels and subsidies ("quality premiums") for fish landings. In particular, the objectives of the Federal program were:

(1) **TRAWLER FISHERY:** To promote an increase in factory-trawlers and freezing fish at sea, as well as the modernization of smaller trawlers which land fresh fish.

(2) **LUGGER FISHERY:** To develop new types of luggers capable of fishing year round, and to improve the marketability of salted herring by preprocessing.

(3) **CUTTER FISHERY:** To develop new types of cutters, and to improve marketing through cooperatives and similar organizations.

The funds made available by the Federal Government for those purposes have been supplemented to a significant degree by the coastal States.

Considerable investments in cold-storage facilities were also made by the fishery ports.



Fig. 2 - German herring lugger behind oil supply boat in foreground in Hamburg-Altona fish harbor.

Furthermore, the coastal States contributed funds to investments necessary to carry out the Federal program.

Continuation of Federal Program: The memorandum asserted that during the initial 3-year period of the Federal program it was possible to complete successfully only certain individual measures, such as the scrapping of obsolete vessels. The memorandum stated that even though some productivity gains were made in domestic fisheries, increased imports made it difficult to create a marketing situation favorable to the fishing industry.

The German trawler fishery is said to have incurred losses amounting to DM 24.5 million (\$6,125,000) in 1963, and losses in 1964 are estimated at about the same amount. Losses incurred by the lugger fishery reportedly amounted to DM 5.6 million (\$1.4 million) and DM 5.1 million (\$1,275,000) in 1963 and 1964, respectively. The situation in the cutter fishery is also believed to have deteriorated in recent years.

The memorandum expressed hope that the adoption of a European Common Market (EEC) fishery policy would permit an improvement in the status of the domestic fisheries. Until that time, however, the German fishing industry will seek Federal support. In order to cover at least part of the losses incurred by the various sectors of the fishing industry, a minimum of DM 15 million (\$3,750,000) in Federal funds in fiscal 1966 is being requested to provide ex-vessel price supports in the form of quality premiums. The memorandum claimed that, in addition, it will be necessary to continue to subsidize the scrapping of obsolete vessels, particularly cutters, at the rate of DM 500,000 (\$125,000) during each of the next 2 fiscal years. It was suggested that the Federal Government not only continue its periodic investigations into

German Federal Republic (Contd.):

the financial status of the trawler trade but also extend them to include the lugger fishery.

Stabilization of Marketing Conditions: The memorandum noted that after the Fish Law of 1955 failed to create a marketing situation favorable to the fishing industry, the trawler and lugger fisheries endeavored to stabilize marketing conditions through the institution of cooperative sales organizations. At first those organizations contributed significantly to a stronger market position. However, the liberalization of fishery imports forced those organizations continuously to take special measures in the interest of market stabilization. Such measures not only included controls on domestic landings, but also the granting of export subsidy payments by the trawler cooperative sales organization totaling DM 7.6 million (\$1.9 million) in 1962, DM 9.8 million (\$2,450,000) in 1963, and DM 7.4 million (\$1,850,000) in 1964.

In order to remove surplus herring supplies from the West German market, the central sales organization of the German lugger fisheries sold salted herring at reduced prices to foreign countries and to East Germany. The "export subsidies" thus granted by the lugger fishery amounted to DM 0.7 million (\$175,000) in 1963 and DM 1.3 million (\$325,000) in 1964.

The memorandum asserted that in spite of the wide range of self-help measures, the fishing industry has not succeeded in stabilizing the market to the necessary degree, and it therefore suggested that the Federal Government appropriate at least DM 5 million (\$1,250,000) a year for that purpose.

Subsidization of Interest Rates on Commercial Loans: The memorandum noted that, as the result of structural changes which have been taking place in the German trawler fleet, investment in new vessels has increased significantly. The construction costs of a modern factory-trawler have increased to DM 8-9 million (\$2.0-2.25 million); those of a fresh-fish trawler or a stern lugger have risen to DM 3.5-5 million (\$0.9-1.2 million). In view of attractive investment opportunities in other sectors of the economy and the comparatively low returns on investments in the fishing industry, it would be possible to attract the capital required by the fishing industry only if

interest rates on commercial fishery loans are subsidized in all cases, rather than having such support subject to individual needs. So far, interest subsidization has been restricted to the construction of new factory-trawlers, luggers, and cutters.

Special Measures for the Cutter Fishery: With regard to the cutter fishery, Government support has merely permitted cutter operators to cover necessary maintenance and repair costs. However, such aid has not prevented the aging of the cutter fleet. On the other hand, cutters may be able to fill the gap in fresh fish production created by the trawler fleet's growing concentration on producing frozen fish. In order to take advantage of that market potential, new and modern cutters are needed. However, the cost of such cutters (patterned upon Danish or Swedish design) far exceeds the financial resources of individual cutter operators even if low-interest loans are granted by the Government. The memorandum therefore suggested that the Federal Government and the coastal States support the foundation of new corporations for the purpose of building new cutters and then chartering them to young and enterprising operators. The cost of such cutters would amount to DM 600,000 to DM 900,000 (\$150,000 to \$225,000) each. The Federal Government would be asked to contribute half of the cost of building eight such cutters.

European Common Market Fisheries Policy: Finally, the memorandum concluded that the unfavorable situation in the German fishing industry is caused by prevailing market conditions. Government aid can afford only partial relief, without effecting a basic change. In view of progressive economic integration within the European Common Market (EEC) and commitments under the German foreign trade policy, such a change can no longer be achieved by legislative measures on a national level. It should rather be an objective of an EEC-wide fish marketing order. (United States Consul, Bremen, July 9, 1965.)

Note: See *Commercial Fisheries Review*, March 1962 p. 39.



Ghana

RECEIVES FOUR MORE NORWEGIAN-BUILT STERN TRAWLERS:

Four new stern trawlers built for Ghana by a Norwegian shipyard combine were turned

Ghana (Contd.):

over to a Ghanaian delegation in Norway during early summer 1965. Two other Norwegian-built trawlers of the same type have already been delivered to the government-controlled Ghana Fishing Corporation, and another was to be completed shortly. This will complete the order with Norway for 7 stern trawlers.

The vessels are 231 feet 7 inches long and have a daily freezing capacity of 24 tons of fish. Refrigerated storage space in the vessels measures 35,000 cubic feet and the temperature can be kept down to below 0° F. even in tropical waters. The vessels are powered by diesel engines generating 1,960 hp., coupled to reversible propellers, with a speed of 14 knots, and can accommodate a crew of 52. (The Export Council of Norway Information Service, June 11, 1965.)

Note: See *Commercial Fisheries Review*, May 1965 p. 67; January 1965 p. 72.



Iceland

EXPORT STOCKS OF PRINCIPAL FISHERY PRODUCTS, MAY 31, 1965:

As of May 31, 1965, Iceland's stocks of frozen groundfish (fillets) for export to the United States totaled 4,880 metric tons, a decline of 2,220 tons from the stocks on hand April 30, 1965. (United States Embassy, Reykjavik, June 25, 1965.)

Icelandic Export Stocks ^{1/} of Principal Fishery Products, May 31, 1965			
Item	Quantity		Value
	Metric Tons	Million Kr.	US\$ 1,000
Groundfish, frozen:			
For export to:			
U. S.	4,880	107.4	2,494.2
Other countries . . .	3,677	63.6	1,477.0
Stockfish	5,800	162.4	3,771.5
Herring:			
Salted	-	-	-
Frozen	1,846	10.5	243.8
Industrial products:			
Fish meal:			
Herring	2,409	17.3	401.8
Other fish	4,292	23.9	555.0
Herring oil	7,879	65.4	1,518.8

^{1/}Includes only stocks intended for export.

Note: Icelandic kronur 43.06 equal US\$1.00

United States imports of frozen groundfish fillets from Iceland in the year 1964 totaled 17,812 tons of groundfish blocks and slabs,

4,669 tons of cod fillets, 2,791 tons of haddock fillets, and 548 tons of ocean perch fillets.

UTILIZATION OF FISHERY LANDINGS, JANUARY 1965:

How Utilized	January	
	1965	1964
... (Metric Tons) ...		
Herring^{1/} for:		
Oil and meal	25,568	24,377
Freezing	5,916	4,828
Salting	1,491	1,108
Groundfish^{2/} for:		
Fresh on ice	3,115	3,687
Freezing and filleting	4,379	10,030
Salting	1,314	3,608
Stockfish (dried unsalted) . .	500	1,807
Oil and meal	170	235
Shrimp for:		
Freezing	31	20
Canning	5	-
Home consumption	1,330	992
Total production	43,819	50,692
^{1/} Whole fish. ^{2/} Drawn fish. Source: <i>Aegir</i> , May 1, 1965.		

FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY 1965:

Species	January	
	1965	1964
... (Metric Tons) ...		
Cod	5,708	11,074
Haddock	2,744	5,618
Salte	692	533
Ling	442	789
Wolfish (catfish)	144	202
Cusk	290	930
Ocean perch	562	646
Halibut	49	101
Herring	32,975	30,313
Shrimp	36	20
Other	177	466
Total	43,819	50,692
Note: Except for herring which are landed round, all fish are drawn weight.		

LABOR DISPUTE IN HERRING FISHERY SETTLED:

A 5-day labor dispute involving Icelandic herring vessel captains ended on July 1, 1965, when the Prime Minister announced that a agreement had been reached by all concerned. The main provisions of the agreement were: (1) the summer price of herring for reduction would be 235 kronur (US\$5.46) per mal (150

Iceland (Contd.):

liters which is equivalent to about 40 gallons or 300 pounds); and (2) the Government will see that exact weighing of herring landed at reduction factories will be provided by the summer of 1966. (United States Embassy, Reykjavik, July 7, 1965.)



Italy

TRADE IN JAPANESE CANNED SALMON LIBERALIZED:

At the bilateral trade negotiations conducted in July 1965 at Tokyo between Japan and Italy, Italy agreed to reduce the number of import items it restricts from Japan to 97, effective August 1, 1965. A total of 26 items was said to have been dropped from the restricted list, including canned salmon. (Japan Economic Journal, July 20, 1965.)



Japan

FROZEN TUNA EXPORTS TO U. S. AND PUERTO RICO, MARCH-MAY 1965:

Japan's exports of frozen tuna to the United States and Puerto Rico in May 1965 in-

creased 129 percent in quantity and 119 percent in value as compared with the previous month. Exports of all species of tuna were up from the April 1965 exports except big-eyed. Those to the United States proper were nearly three times more and to Puerto Rico they were double the April exports.

The April exports of frozen tuna to the United States and Puerto Rico were down 20 percent in quantity and 12 percent in value from the previous month's exports. Yellowfin tuna exports increased 69 percent from March to April, but exports of albacore were down 63 percent. (Fisheries Attache, United States Embassy, June 14 and July 7, 1965.)

FISH LANDINGS AT MAJOR TUNA PORT, JUNE 1965:

Landings (mainly tuna) at the Japanese port of Yaizu in June 1965 totaled 17,420 metric tons valued at 1,187 million yen (US\$5.2 million), according to the Yaizu Fishermen's Cooperative Association. Compared to June 1964, landings in 1965 dropped 7 percent (1,274 tons) due to smaller catches of mackerel and skipjack, but that was offset by the increased catch of albacore. Compared to June 1964, the albacore landings showed a sevenfold increase in quantity and a \$2-mil-

Japan's Exports of Frozen Tuna by Species to United States and Puerto Rico, March-May 1965

Species	May		April		March	
	Quantity	Value	Quantity	Value	Quantity	Value
	Short Tons	US\$1,000	Short Tons	US\$1,000	Short Tons	US\$1,000
Skipjack:						
United States	-	-	-	-	2	1
Puerto Rico	-	-	-	-	-	-
Total	-	-	-	-	2	1
Albacore:						
United States	3,399	1,013	795	237	1,270	383
Puerto Rico	409	119	531	151	2,335	634
Total	3,808	1,132	1,326	389	3,605	1,017
Yellowfin:						
United States	3,593	1,124	2,046	683	1,303	406
Puerto Rico	2,502	708	846	258	405	97
Total	6,095	1,832	2,892	941	1,708	503
Big-eyed:						
United States	46	12	48	12	98	24
Puerto Rico	30	6	92	19	5	1
Total	76	18	140	31	103	25
Total United States	7,038	2,149	2,889	932	2,673	814
Total Puerto Rico	2,941	833	1,469	428	2,745	732
Grand Total	9,979	2,982	4,358	1,360	5,418	1,546

Source: Japan's Bureau of Customs.

Japan (Contd.):

Fish Landings at Yatsu, Japan, June 1965			
Species	Landings	Value	Average Price
	Metric Tons	US\$ 1,000	\$/M.T.
Albacore	9,575.7	2,559	267
Skippack	2,662.6	837	314
Other tuna	4,542.3	1,609	354
Mackerel	118.8	14	117
Others	520.6	162	311
Total	17,420.0	5,181	-

lion increase in value. (Suisan Keizai Shim-bun, July 12, 1965.)

SUMMER ALBACORE TUNA FISHERY CATCH:

The total catch of the Japanese summer pole-and-line albacore tuna fishery, which ended early July 1965, was estimated at 45,000 metric tons. This was an increase of about 12,000 tons over the 1964 catch. It is estimated that of the 1965 production, about 10,000 metric tons were exported to the United States in the round, 2,000 tons processed into loins for export, 8,000 tons processed into "fushi" and "namaribushi" (dried or semidried loins) for the domestic market, 23,000 tons canned, and 2,000 tons held in stock. At the beginning of the fishing season (late April), the pole-caught albacore for export to the United States sold for US\$315 a short ton f.o.b. Japan. As the season progressed and catches increased, the export price declined to \$300, then tumbled to \$270, but toward season's end as catches declined sharply the price recovered to \$295-298. (Suisan Tsushin, July 7, 1965.)

ATLANTIC LONG-LINE TUNA FISHERY TRENDS:

Data from the Japanese Fisheries Agency show that the tuna catch of Japan's portable-boat-carrying tuna motherships operating in the Atlantic Ocean this year declined slightly in June as compared to May. Available data from 40 portable boats showed 5 boats averaged over 3 tons a day, 9 averaged less than 1.5 tons, and 26 boats caught between 1.5-3 tons a day. But in May, 14 boats averaged over 3 tons a day, 5 boats less than 1.5 tons, with most boats averaging 1.5-2.5 tons. About 15 tuna motherships fished in June in the

area between 20°-30° N. latitude and 40°-70° W. longitude. In June albacore led all landings, followed by yellowfin, bluefin, and big-eyed; in May the principal species landed (in order of quantity) were albacore, yellowfin, big-eyed, and bluefin. (Suisan Keizai Shim-bun, July 12, 1965.)

MOSTLY ALBACORE TUNA CAUGHT BY LONG-LINE VESSELS IN SOUTH ATLANTIC:

The tuna catch of the Japanese long-line vessels operating in the South Atlantic Ocean was mostly albacore tuna as of early July 1965. Off Angola, albacore made up about 70-80 percent of landings, averaging in weight about 13 kilograms (28 lbs.) per fish, and off Puerto Rico the catch was made up of 60-70 percent albacore.

The price of frozen round albacore transhipped to Puerto Rico was US\$290-295 a short ton f.o.b. port of transshipment. Due to the short supply of yellowfin, gilled-and-gutted yellowfin shipped to Italy were selling for \$410-415 a metric ton c. & f. Bluefin exported to Italy were selling for \$340 a metric ton and big-eyed at about \$280 a ton c. & f. (Suisan Tsushin, July 14, 1965.)

TUNA MOTHERSHIP CATCH IN SOUTH PACIFIC:

A large Japanese fishing company's tuna mothership Yuyo Maru (5,043 gross tons), which departed Tokyo May 11, 1965, began catching in July 1965 an average of 2.8 metric tons of fish (mainly tuna) per catcher vessel per day. The mothership fleet switched its effort from yellowfin to albacore tuna, and had caught as of July 11 a total of 2,374 metric tons of fish, including 1,265 tons of yellowfin, 321 tons of albacore, and 352 tons of other tuna species. (Suisancho Nippo, July 17, 1965.)

PLANS TO STABILIZE ALBACORE TUNA MARKET:

The Japanese Federation of Tuna Fishermen's Cooperative Association (NIKKATSUREN), the Frozen Tuna Producers Association, and the Frozen Tuna Exporters Association held a meeting on June 3, 1965, to discuss ways of coping with the unstable albacore tuna prices resulting from an over-supply of fish due to unusually heavy landings

Japan (Contd.):

of albacore made by the summer pole-and-line fishery off Japan.

Price stabilization measures proposed at the meeting were: (1) Albacore exports from Japan proper over and above the established quota (30,000 short tons) not be permitted; (2) Atlantic albacore transshipments to the United States be limited to 36,000 short tons a year (the allocation of quotas to those engaged in the Atlantic tuna fishery be studied); (3) the minimum export price for Atlantic-caught albacore be set at US\$300 a ton f.o.b. Las Palmas (Canary Islands), and a study undertaken to determine the feasibility of establishing a sales agency to enforce the maintenance of that price--also, an export plan which takes into consideration such factors as country of destination, timing and supply, be established and a standard export price based on actual freight costs to points of destination developed; (4) promotional work aimed at increasing white meat tuna demand in the United States be launched; (5) a suitable quantity of pole-caught albacore be consigned to Japanese packers for processing into canned tuna in oil for domestic consumption, which presently totals only about 100,000 cases a year--also, extensive efforts be directed to promoting domestic demand for that product.

The three Japanese industry organizations again met on June 10 and unanimously agreed to launch a promotional campaign to stimulate domestic demand for tuna packed in oil. Based on the prediction that 50,000 metric tons of pole-caught albacore would be landed in Japan in the 1965 season, NIKKATSUREN expressed the hope that about 15,000 tons could be diverted to the domestic market. Of that quantity, NIKKATSUREN hoped that the large packers would take on consignment the packing and sale of 3,000-4,500 tons which NIKKATSUREN will purchase. One of the larger Japanese packing firms and other large packers were reported to have expressed willingness to cooperate actively in that plan but did not commit themselves as to quantity.

The Atlantic Tuna Committee of the Japanese tuna industry group (representing producers, freezers, packers, and exporters) met June 25, 1965, and agreed to establish a 36,000-short-ton Atlantic albacore export quota (for transshipment to the United States) to be allocated as follows: 30,000-ton actual performance quota (20,000 tons to be allocated

on basis of past export performance record and 10,000 tons to be allocated according to vessel-carrying capacity); 5,500-ton supplementary quota; and 500-tons for newly licensed exporters. Exporters will be permitted to freely transfer their allotted quotas among themselves. The plan was to be implemented August 1, 1965.

The Committee also adopted a plan to ship Atlantic albacore tuna to U. S. west coast packers to avoid an oversupply at Puerto Rico. Atlantic tuna vessel operators will be assessed two yen per kilogram (US\$5 a short ton) on their catch of albacore to help defray the increase in transportation costs. (Suisan Keizai Shimbun, June 4 and June 27; Suisan Tsushin, June 12, 1965.)

SECOND GOVERNMENT-INDUSTRY TUNA MEETING:

The Japanese Government scheduled a series of Government-industry meetings in 1965 to exchange views and to seek ways and means of strengthening the tuna industry. On June 28-29, 1965, the second series of meetings was held. Subjects discussed were international tuna fishery regulation, technical assistance to foreign countries, overseas-based fishing operations, and fishing effort. The general consensus was described as follows:

International fishery regulation: Heretofore, Japan has maintained a negative attitude toward tuna fishery regulatory proposals advanced by foreign countries. However, Japan can no longer turn her back on the current trend toward international regulation and must actively cooperate in such programs.

Overseas technical assistance: Japan should cooperate in extending basic technical assistance to other countries. She should not be wary about the expansion of tuna fishing operations by foreign countries, such as Formosa and South Korea, but must pursue a policy of utilizing high-seas resources without creating friction with those countries in order to further promote the growth of the Japanese tuna industry.

Overseas-based fishery: Ten years have elapsed since the Japanese tuna base at Samoa was established, but on an overall basis recent developments in the overseas-based fishery have not been very favorable. Other countries are beginning to direct their atten-

Japan (Contd.):

tion to base-type operations so Japan must employ efficient vessels to compete with those countries. In view of the importance of overseas bases for operation of small fishing vessels, Japanese producers and exporters must cooperate with foreign importing firms to secure vessel supplies and recreational facilities for crew members.

Fishing effort: The decline in hook rate has been due to the intensification of fishing effort. Effort should be restricted but it will be difficult to assess the effect any limitations placed on Japanese effort will have without considering developments on a world-wide basis. (Suisan Keizai Shimbun, June 30, 1965.)

CANNED TUNA IN BRINE STOCKS ON HAND:

Japan is reported to have in stock about 1.7 million cases of canned tuna in brine. Of that quantity, 1.5 million cases are said to be consigned to the Canned Tuna Sales Company and about 200,000 cases held in stock by the packers. Exports of canned tuna in brine to the United States, as of early July 1965, were reported to total about 1,240,000 cases.

The market for Japanese canned tuna in the United States was reported in early July as being very soft and export prospects for the remainder of the year not bright. (Suisan Tsushin, July 9 & 12, 1965.)

CANNED TUNA EXPORTERS ASK SALES COMPANY FOR PRICE-QUANTITY ADJUSTMENTS IN JULY SALES:

Chairman of the Tuna Department, Japan Canned Foods Exporters Association, submitted a request in July 1965 to the Japan Canned Tuna Sales Company asking that (1) the quantity of canned tuna to be released in July be limited to a total of 100,000 cases, consisting of 50,000 cases each of white and lightmeat tuna (note: A total of 250,000 cases was offered for sale for June-July by the Sales Company); (2) a promotional allowance of US\$0.50 a case be granted for the white-meat pack; and (3) a premium of \$0.20 per case be placed on the 7-oz. and 13-oz. lightmeat packs to encourage their production.

The request was expected to be taken up for consideration by the executive board of

the Canned Tuna Packers Association. (Suisan Tsushin, July 15, 1965.)

SALMON PACK AVAILABLE FOR EXPORT:

The land-based salmon packers in Japan were expected to have available for consignment to the Canned Salmon Sales Company for sale to foreign countries a total of 300,000 cases of pink salmon, consisting of 200,000 cases of 48 $\frac{1}{2}$ -lb. cans and 100,000 cases of 96 $\frac{1}{4}$ -lb. cans.

The companies operating the salmon mother-ships seem certain to have available for export 250,000 cases of pink salmon, consisting of 200,000 cases of 48 $\frac{1}{2}$ -lb. cans and 50,000 cases of 96 $\frac{1}{4}$ -lb. cans.

On July 16, 1965, the Canned Salmon Sales Company announced that for the first sale of canned pink salmon export prices would be:

Destination	Pack	\$/Case $\frac{1}{2}$
Europe	48 $\frac{1}{2}$ -lb. cans	2/12.20
Australia-New Zealand .	" " "	12.30
All countries	96 $\frac{1}{4}$ -lb. cans	3/13.50
1/F.o.b. Japan		
2/Former price: \$11.50/case.		
3/No change in price.		

The shipping deadline was September 30, 1965.

Reportedly, the f.o.b. export price of \$12.20 a case for the $\frac{1}{2}$ -lb. pack, when converted to a c.i.f. price (destination Great Britain) is equal to 94 shillings 3 pence (US\$13.20). The former c.i.f. price was 89 shillings 5 pence (US\$12.52), so the new price represents an increase of \$0.68 a case.

Canadian salmon packers are reported to have offered their product (to be shipped before December 1965) to Great Britain for 97 shillings c.i.f. But since Britain on the Japanese products assesses an import duty of 5 percent, the c.i.f. price of the Japanese 48 $\frac{1}{2}$ -lb. cans actually totals about 99 shillings a case or some 2 shillings (US\$0.28) a case higher than the Canadian product. This price differential is expected to make it somewhat difficult for Japanese trading firms to sell the full amount (approximately 320,000 cases of 48 $\frac{1}{2}$ -lb. cans) of pinks to be offered for the first sale before the shipping deadline of September 30. (Suisan Tsushin, July 13 & 19, 1965.)

Japan (Contd.):

NORTH PACIFIC-BERING SEA SALMON AND BOTTOMFISH TRENDS:

The 11 Japanese salmon motherships operating in the North Pacific and Bering Sea were expected to reach their catch targets (totaling 45,478 metric tons) towards the end of July 1965 and to return to Japan July 31-August 4, or about 20 days earlier than in 1964. (Suisancho Nippo, July 21, 1965.)

The Japanese Bering Sea mothership-type bottomfish fleet landed, as of July 18, 1965, about 200,200 metric tons of fish, equal to 51 percent of the combined target of 390,000 tons. (Suisancho Nippo, July 21, 1965.)

KING CRAB PRODUCTION TRENDS:

The four Japanese king crab factoryships operating in the Okhotsk Sea were averaging 21.4 crabs a shackle and had packed a total of 205,536 cases as of July 8, 1965. That was equal to 86 percent of their production target of 240,000 cases (48 $\frac{1}{2}$ -pound cans).

The two Japanese crab factoryships, Tainichi Maru (5,859 gross tons) and Токеи Мару (5,385 gross tons), operating in Bristol Bay packed a total of 126,535 cases as of the same date, equal to 68 percent of their combined target of 185,000 cases. They averaged 11.7 crabs a shackle. (Suisan Tsushin, July 12, 1965.)

FIRM TO USE LARGER TRAWLER FOR GULF OF ALASKA FISHERY:

The Japanese fishing company which was scheduled to use the 560-ton trawler Tatsuta Maru (accompanied by the 276-ton trawler Fukuho Maru) in the Gulf of Alaska in 1965 decided to cancel that vessel's operation and to use a 3,000-ton trawler instead.

The Tatsuta Maru was originally scheduled to fish for shrimp off Kodiak. The vessel is not considered suitable for other types of operation elsewhere in the Gulf due to its small size and consequently will be replaced by a larger vessel. Ten other large Japanese trawlers, accompanied by either 1 or 2 smaller trawlers, are licensed for operation in the northeastern Pacific this year, but those 10 vessels range in size from 1,500-3,000 tons.

(Suisan Tsushin, July 9; Suisan Keizai Shim-bun, June 2, 1965.)

BERING SEA SHRIMP FISHERY TRENDS:

The Japanese factoryship fleets operating in the Bering Sea and engaged in the production of canned shrimp reported poor fishing as of early July 1965. The factoryship Einin Maru (7,491 gross tons) is said to have produced about 60 percent of the quantity she produced a year earlier for the same period. By season's end, that factoryship's canned shrimp production is expected to total 250,000-300,000 cases. Estimated shrimp production figures for the factoryship Chichibu Maru (7,472 gross tons) were not available but that factoryship also reported poor fishing. (Suisan Tsushin, July 13, 1965.)

FIRM PLANS TO OPERATE LARGE TRAWLER IN NORTHWEST ATLANTIC:

A large Japanese fishing company has decided to dispatch a 3,000-ton trawler to the northwest Atlantic in winter 1966. The trawler, to be newly constructed, is scheduled to be based at St. Pierre Island off Newfoundland and will fish for cod. The catch will be processed into fillets on board ship and exported to the United States. In 1963/64 the same firm operated the stern trawler Tenyo Maru No. 3 (3,698 gross tons) in the northwest Atlantic but the vessel, which was a conversion job, was found unsuitable for operation in those waters. (Shin Suisan Shim-bun Sokuho, July 8, 1965.)

FISHING VESSELS IN ATLANTIC TO BE REFUELED AT SEA BY TANKER:

The 900-ton Japanese oil tanker Shotoku Maru (chartered by a trading firm for refueling fishing vessels at sea in the Atlantic Ocean) was scheduled to depart Japan in mid-July 1965. Initially the tanker was to serve tuna long-liners and trawlers operating in waters off South America. Should the tanker operate out of Venezuela, the fuel cost to the participating fishing vessels is expected to run about 17,000 yen a kiloliter (US\$0.18 a gallon). The Shotoku Maru was also expected to supply provisions, fresh water, and engine parts to the Japanese vessels. (Suisan Keizai Shim-bun, July 1, 1965.)

Japan (Contd.):

LARGE FISHERY STERN-TRAWLER RESEARCH VESSEL PLANNED:

The Japanese Fisheries Agency is developing specifications for a 2,000-ton stern-trawler research vessel. The vessel is to be constructed over a 3-year period at a total cost of 1,097 million yen (US\$3 million). For FY 1965 (April 1965-March 1966) about 200 million yen (\$555,000) have been budgeted. If funding permits, a 2,600-ton vessel may be constructed.

The research vessel will be a stern trawler type and will carry two 15-meter (49-foot) long portable boats for tuna long-lining. It will have an electrical propulsion system (to facilitate research) capable of developing a maximum speed of 15 knots, and a cruising range of 10,000 nautical miles. It will be equipped with 75 bunks, 6 experimental rooms, and 4 freezing rooms. (Suisancho Nippo, July 19, 1965.)

EXPORTS OF FROZEN**RAINBOW TROUT, MAY 1965:**

Japan's exports of frozen rainbow trout in May 1965 amounted to 226 short tons valued at US\$167,553. The quantity shipped in May was only slightly more than the 222 tons valued at \$171,403 exported the previous month.

Japan's Exports of Frozen Rainbow Trout by Country of Destination, May 1965		
Destination by Country	Quantity	Value
	Short Tons	US\$
United States	125	94,211
United Kingdom	38	24,859
Hong Kong	2	2,047
Belgium	18	14,242
Canada	22	16,625
Australia	3	2,198
Sweden	3	2,353
Netherlands	13	8,992
Other	2	2,026
Total	226	167,553

Source: Japan's Bureau of Customs.

The United States continued during both April and May as the leading export market for that product. (Fisheries Attache, United States Embassy, Tokyo, July 7, 1965.)

DOMESTIC FISH MEAL MARKET TRENDS:

Japanese livestock producers agreed to purchase from the fishing companies operating fish-meal factoryships in the eastern Bering Sea their production of fish meal for 73,000 yen (US\$203) a metric ton. This was an increase of 9,250 yen (\$25.69) a metric ton over the price paid for factoryship-produced meal in spring 1965.

A Japanese trading firm contracted to deliver to a European firm 600 metric tons of factoryship-processed fish meal for US\$214 a metric ton, c.i.f. Rotterdam. Shipping period was to be September-October 1965. The meal was to be transported aboard a Japanese tanker scheduled to deliver whale oil to Europe. Consequently, the transportation cost was expected to be very low. In essence this means that the fishing companies operating the fish-meal factoryships received a better price than the \$203 a ton paid by the Japanese livestock producers. (Suisan Tsushin, July 20; Suisancho Nippo, July 17, 1965.)

FISH MEAL PRICES INCREASE FOR DOMESTIC OFFERINGS OF FACTORYSHIP PRODUCTION:

The three major Japanese fishing companies operating fish-meal factoryships in the eastern Bering Sea have offered to sell their production on the domestic market for 73,000 yen (US\$203) a metric ton. In the spring of 1965, one of the three firms was selling fish-meal for 63,750 yen (\$177) a ton, but Japanese prices increased with the rise in prices for Peruvian fish meal. About 31,000 to 32,000 tons of Japanese factoryship-produced meal are expected to be available for release in the last half of 1965. (Suisan Tsushin, June 25, 1965.)

HOKKAIDO FISHERMEN PROTEST JOINT SOVIET-JAPANESE OKHOTSK SEA FISH-MEAL OPERATIONS:

Representatives of the Hokkaido fishing industry called on the Japanese Fisheries Agency Director on June 21, 1965, to protest the plans of major Japanese fishing firms to cooperate with the Soviet Union in joint fish-meal operations in the Okhotsk Sea. In the spring of 1965 one large Japanese firm, under an agreement concluded in December

Japan (Contd.):

1964, successfully conducted such an operation. After a rendezvous in the Okhotsk Sea, its fish-meal factoryship was supplied with Alaska pollock caught by Russian trawlers. Subsequently, other major Japanese firms have shown great interest in engaging in such an operation, in part to offset their reduction in whaling effort in the Antarctic Ocean. It has been reported that this conflict may be settled on a political level in the fall of 1965. (Suisancho Nippo, June 22, 1965, and other sources.)

Note: See Commercial Fisheries Review, May 1965 p. 76.

NORTH PACIFIC SPERM WHALE STUDY:

The Japanese Government's Whale Research Institute is planning to conduct an ecological and biological study of sperm whales in the North Pacific. Under the plan, which has been approved by the Fisheries Agency, 5 whale catcher vessels from a large Japanese fishing company will be delegated the task of collecting the scientific data. The vessels were scheduled to conduct the studies beginning in mid-August 1965 and would operate mainly off Hokkaido. Japan hopes to gain data on herd, length, and age composition to present to the International Whaling Commission in connection with the problem on harvestable sizes of sperm whales. (Suisan Keizai Shimbun, July 2, 1965.)

ANTARCTIC WHALING FLEET PRESEASON OPERATION OUT OF SOUTH GEORGIA ISLAND:

A Japanese whaling firm, which has a three-year agreement (beginning in 1964) to conduct whaling operations out of South Georgia Island, has decided to change its operational plans for this year (1965/66 season) and operate a whaling fleet out of that base for about 2½ months prior to the opening of the Antarctic whaling season. Under this change, the whale catchers and support vessels assigned to the South Georgia Island base will be transferred to Antarctic whaling in mid-December 1965, thereby assuring their maximum and most efficient use. (Suisan Tsushin, June 25, 1965.)

WHALE MEAT TO BE PURCHASED FROM NORWEGIAN WHALING FLEET:

A large Japanese fishing company has signed a provisional agreement to purchase whale meat from a Norwegian whaling fleet during the 1965/66 Antarctic whaling season. Under the agreement, the Japanese firm will charter to the Norwegian Kosmos IV fleet 5 catcher vessels (including crews) at 255 million yen (US\$708,000) to harvest the equivalent of 255 blue-whale units. The whales will be processed on the Norwegian factoryship and their meat sold back to the Japanese firm for 60,000 yen (US\$167) a metric ton. (Suisan Tsushin, July 9, 1965.)

WHALE OIL SALES AGREEMENT FOR DOMESTIC MARKET:

The Japanese whaling firms engaged in whaling in the North Pacific and Bering Sea have concluded a contract to sell 7,000 metric tons of their 1964/65 production of fin whale oil for 89,000 yen (US\$247) a metric ton to domestic buyers. (Suisancho Nippo, June 22, 1965.)

IMPORTS OF MARINE PRODUCTS INCREASING:

The value of Japanese imports of fishery products, which stood at ¥8,030 million (US\$22.3 million) in 1961 and ¥7,810 million (\$21.7 million) in 1962, increased to ¥16,160 million (\$44.9 million) in 1963 and in 1964 rose to ¥25,590 million (\$71 million).

Major import items have been fish meal from Peru, octopus and cuttlefish from Spain, and shrimp and spiny lobsters from Mexico and Communist China.

Observers ascribe the increasing imports to the following causes:

- (1) A decline in domestic production of fishery products since 1962.
- (2) Liberalization of import regulations for marine products.

Rising imports of marine products have been particularly noticeable since the start of 1965. Under barter arrangements completed in early 1965, 9,000 metric tons of fish-

Japan (Contd.):

ery products--chiefly herring and salmon--will be imported from the Soviet Union during the year in exchange for exports of Japanese apples.

Imports of dried cuttlefish and dried laver are expected from South Korea in the wake of normalization of diplomatic relations between Japan and the Republic of Korea.

An import contract for raw fish was concluded by a Japanese trading house with Communist China at the end of May 1965. Under the contract, 8,000 tons of raw fish are to be shipped to Japan in the fall of 1965.

The rising trend in imports has disturbed Japan's coastal fishermen. On the ground that increasing imports of fishery products are imposing pressure on small-scale fishing operations in coastal waters, the All-Japan Federation of Fishing Cooperatives is expected to ask the Government for steps to adjust imports of marine products. (The Japan Economic Journal, June 29, 1965.)

CANNED FISHERY PRODUCTS IN SHORT SUPPLY ON DOMESTIC MARKET:

Following is a report published in Kanagawa Shimbun, June 26, 1965, describing a shortage of canned fishery products on the Japanese domestic market:

Mackerel, crab, salmon, tuna, and bonito are among the canned products in short supply on the Japanese domestic market. The shortage is due to declining catches in coastal waters and also in offshore fisheries subject to international regulation, such as the salmon fishery. In addition, for species such as tuna and salmon, the Japanese domestic market meets strong competition from export sales.

Mackerel is the most critical item on the list, with a maximum pack of only 350,000 cases forecast this year, as compared with 1.3 million cases last year. The pack of crab is also expected to be down sharply in 1965.

The average price of canned fishery products on the Japanese domestic market has already increased 10 to 15 percent over the 1964 price level and may increase another 10 percent.

COMMUNIST CHINA PROTESTS ILLEGAL FISHING BY JAPANESE VESSELS:

In a strongly worded letter dated June 7, 1965, to the Japan-China Fishery Association in Japan, the Communist China Fishery Association sharply criticized the fishing activities of Japanese fishing vessels operating off the Chinese coast. The letter charged that over 20 Japanese vessels had been operating illegally in waters closed to fishing under the terms of the private fishery agreement concluded between Japan and Communist China in November 1963, and demanded prompt withdrawal of the offending vessels in the interest of Japanese-Chinese friendship. It also demanded assurance that the Japanese will not commit such infractions in the future. It was reported to be the third time that the Communist Chinese have protested against illegal fishing by Japanese vessels.

The Japan-China Fishery Association, concerned over the future of the private fishery agreement, informed the Communist China Association that Japan would immediately issue warnings to all Japanese fishing vessels and would call a special meeting to study suitable measures to cope with the problem. (Suisan Keizai Shimbun, June 11, 1965.)



Republic of Korea

PROGRESS ON FISHING FLEET BEING BUILT BY FRENCH-ITALIAN CONSORTIUM:

By April 1, 1965, ten 98-foot tuna vessels of 140 gross tons had been launched for Korea by a French-Italian consortium under a contract signed January 21, 1963, and amended December 11, 1963, and February 3, 1964. One of the new tuna long-line vessels sailed for Korea in the spring of 1965, and the others were expected to follow in a short time.

Over 90 vessels are to be built for Korea by the French-Italian consortium, including trawlers as well tuna vessels. Construction has already begun under the contract on two 253-foot stern trawlers, each of which will have a frozen fish hold capacity of 31,784 cubic feet. One of the stern trawlers is scheduled for completion in December 1965 and the other in February 1966. (The Fishing News, June 11, 1965.)

Note: See Commercial Fisheries Review, May 1965 p. 81, and Dec. 1964 p. 105.



Malaysia

EXPANSION OF SINGAPORE TUNA INDUSTRY PLANNED:

The Singapore Economic Development Board announced earlier this year that it was prepared to invest US\$25 million to develop a tuna fishing industry, based on survey reports by two French consultants who came to Singapore at the invitation of the Board. The Board will provide technical information and financing for the construction of fishing vessels and loans for the purchase of fishing gear. They hope to export both canned and frozen tuna. (United States Consulate, Singapore, April 16, 1965.)

TUNA FISHING VESSELS BEING PURCHASED FROM JAPAN:

An application to export from Japan 7 used fishing vessels (3 vessels of 350 to 390 tons, 2 of 220 to 260 tons, and 2 of 180 tons) to Malaysia was approved in June 1965, by the Japanese Fisheries Agency. Two of the vessels are expected to be used for training purposes and the remaining 5 for tuna fishing.

The vessels were to be sold to the jointly operated Japanese-Malayan company at Penang which is engaged in the production of frozen and canned tuna. The firm is purchasing the vessels to assure itself of a regular supply of raw material. (*Suisan Keizai Shimbun*, June 20, 1965.)

Note: See *Commercial Fisheries Review*, April 1965 p. 77.



Mexico

IMPORTS OF MARINE OIL, 1963-1964:

Cod oil is the main item in Mexican imports of marine oil, and the leading suppliers

Mexican Imports of Marine Oil, 1963-1964		
Commodity & Country	1964	1963
	(Metric Tons)	
Sperm oil:		
United States	2.9	1.2
United Kingdom	11.1	12.0
Other countries	5.1	1.8
Total sperm oil	19.1	15.0
Whale, seal, and shark oil:		
United States	52.2	99.9
United Kingdom	80.3	78.4

(Table continued on next column.)

Commodity & Country	1964	1963
	(Metric Tons)	
Germany	10.1	65.2
Other countries	21.0	10.7
Total whale, seal, and shark oil . .	163.6	254.2
Cod oil:		
United States	138.4	141.1
Norway	706.6	498.5
United Kingdom	134.2	45.4
Other countries	60.6	22.0
Total cod oil	1,039.8	707.0
Fish-liver oil:		
Ireland	27.7	38.8
Other countries	-	0.2
Total fish-liver oil	27.7	39.0

are Norway, the United States, and the United Kingdom. In 1964, an increase in imports of cod oil more than offset a decline in imports of whale, seal, and shark oil. (Agricultural Attache, United States Embassy, Mexico, D.F., May 21, 1965.)



New Zealand

SCALLOP INDUSTRY:

New Zealand has hopes of establishing an export market for its developing scallop fishery. The New Zealand scallop (*Pecteus novaezelandiae*) grows to a size of 6 inches across the shell.

The New Zealand scallop fishery began in 1960. At that time, the Government issued licenses to a limited number of operators to take scallops off South Island in the vicinity of Nelson and Kaipara Harbor. The fishery is still closely regulated by the Government. Scallop shucking at sea is prohibited to avoid any damage to fishing grounds that might result from dumping shells overboard. A problem in the New Zealand industry is the lack of clear knowledge about the extent of the resource. Also, the high price levels now prevailing for limited production make scallops a luxury item in New Zealand. (New Zealand *Commercial Fishing*, June 1965.)



Norway

CANNED FISH EXPORTS, JANUARY-MARCH 1964-1965:

Preliminary data show that Norway's total exports of canned fishery products in Jan-

Norway (Contd.):

January-March 1965 were up about 24 percent from the same period of the previous year due mainly to larger shipments of smoked small sild and brisling.

Norwegian Exports of Principal Canned Fishery Products, January-March 1964-1965		
Products	Jan. 1-Mar. 27 1965	Jan. 1-Mar. 28 1964
 (Metric Tons)	
Brisling	1,773	1,437
Smoked small sild ..	3,763	2,835
Kipperd herring	879	716
Soft herring roe	56	101
Sild delicatessen	157	106
Shellfish	287	413
Other fishery products ..	644	484
Total	7,559	6,092

The Norwegian 1965 canning season for small sild was scheduled to begin May 1. The brisling canning season was to open May 19 if the brisling met certain standards of size and quality. (Norwegian Cannery Export Journal, May 1965.)

HERRING FISHERY TRENDS IN THE NORTH SEA AREA, JANUARY-MAY 1965:

In January-May 1965, the total Norwegian catch of North Sea herring amounted to 1,025,000 hectoliters (95,325 metric tons), or almost 3 times more than in the same period of 1964. The increased catch of North Sea herring this year has partly been offset by reduced landings of other species of fish (sand eel and Norway pout) for reduction purposes. However, in the first 5 months of 1965, total deliveries of fish to Norwegian reduction plants in the North Sea area were 87 percent higher than in the same period of 1964. A substantial part of the Norwegian purse-seine fleet was attracted to the herring fishery in the North Sea. (United States Embassy, Oslo, July 8, 1965.)

HIGHER LOAN CEILING APPROVED FOR STATE FISHERIES BANK:

The Norwegian Storting has increased the lending ceiling of the State Fisheries Bank to 80 million kroner (US\$11.2 million) following unanimous recommendations by the Fisheries Committee as well as the Finance Committee. That represents an increase of 20 million kroner (\$2.8 million) in the loan ceiling. (United States Embassy, Oslo, July 8, 1965.)

FISHERIES EXHIBITION, AUGUST 19-29, 1965:

Norway's King Olav V opened his country's 2nd Official Fisheries Fair in Trondheim, August 19-29, 1965. The Fair was sponsored by the Norwegian Ministry of Fishing and organized by the Norwegian Trade Fairs Organization.

The 175 exhibitors from Norway and abroad who participated in the Fair gave a broad picture of technical developments in fisheries all over the world. Important sections of the Fair were devoted to: (1) processing of fishery products, (2) machinery, (3) fishing gear, (4) vessel equipment, and (5) technical aids to navigation.

AIR-BUBBLE CURTAIN EXPERIMENTS PROVE EFFECTIVE:

Experiments conducted by the Norwegian Society for Industrial and Technical Research (SINTEF) show that a "wall" of rising bubbles, made by pressing air through a perforated hose at the sea bottom, will stop fish just as effectively as a fishing net. By moving the hose, 50 coalfish in a 9-foot water tank were driven into a corner, and not even a frogman could scare any of the fish through the air barrier. SINTEF is now trying to make the technique economically feasible for the commercial fisheries. The Norwegian fiords were believed especially well suited for the new method. By installing a hose and an air compressor at the mouth of the fiord, a fence could be "switched on" as soon as one of the large, seasonal shoals of fish moves in. (The Export Council of Norway Information Service, June 11, 1965.)



Territory of Papua and New Guinea

FREEZING AND PROCESSING PLANT FOR SPINY LOBSTERS OPENS:

A freezing and processing plant for spiny lobsters costing £A8,000 (US\$17,900) was opened earlier this summer on Yule Island, one of the Pacific Islands in the Territory of Papua and New Guinea. The area is considered one of the Territory's major spiny lobster grounds.

The plant is owned by a Papua-New Guinea fishing organization (Fishing Society) which plans to build up a spiny lobster industry for

Territory of Papua and New Guinea (Contd.):

export to Australia, the United States, and Europe. The Society was formed in 1961 to develop the commercial potential of the spiny lobster runs that occur each year between October and April. (Australian Fisheries Newsletter, July 1965.)



Peru

FISH OIL EXPORTS, JANUARY-APRIL 1965:

Exports of fish oil (crude and semirefined) from Peru during the first 4 months of 1965 totaled 70,100 metric tons, almost twice the 35,300 tons exported in January-April 1964. Much of the increase was due to larger shipments to the Netherlands (up from 14,300 tons to 47,200 tons). The shipments in 1965, however, include quantities destined for Dutch storage warehouses. Shipments to West Germany also rose from 8,800 tons to 12,200 tons. (Foreign Agriculture, July 12, 1965, U. S. Dept. of Agriculture.)



Portugal

CANNED FISH EXPORTS,
JANUARY-MARCH 1965:

Portugal's total exports of canned fish in oil or sauce in the first quarter of 1965 were up 18 percent from those in the same period of the previous year, due mainly to larger sardine shipments.

Portuguese Canned Fish Exports, January-March 1964-1965				
Product	1965		1964	
	Jan.-Mar.		Jan.-Mar.	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In oil or sauce:				
Sardines	17,485	920	14,055	739
Chinchards	392	20	674	35
Mackerel	1,010	40	878	34
Tuna & tunalike	411	14	360	11
Anchovy fillets	1,020	102	1,138	114
Others	154	8	245	12
Total	20,472	1,104	17,350	945

Portugal's principal canned fish buyers in the first quarter of 1965 were Germany with 4,665 metric tons, the United Kingdom with 2,417 tons, Italy 2,619 tons, France 1,710 tons,

the United States 1,503 tons, and Belgium-Luxembourg 1,494 tons. Germany's purchases of canned fish from Portugal in the first quarter of 1965 increased 44 percent from those in January-March 1964. Purchases by Italy were also up. But purchases by the United States and France were down. (Conservas de Peixe, May 1965.)

CANNED FISH PACK,
JANUARY-MARCH 1965:

The Portuguese pack of canned fish in oil or sauce in the first quarter of 1965 totaled 307,000 cases (mostly sardines and anchovy fillets). The Portuguese pack is traditionally

Portuguese Canned Fish Pack, January-March 1964-1965				
Product	1965		1964	
	Jan.-Mar.		Jan.-Mar.	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In oil or sauce:				
Sardines	2,249	118	3,358	177
Chinchards	79	4	225	11
Mackerel	179	7	198	8
Tuna & tunalike	365	12	998	33
Anchovy fillets	1,463	146	1,008	101
Others	385	20	218	11
Total	4,720	307	6,005	341

light in the first quarter, since the main canning season begins later in the year. (Conservas de Peixe, May 1965.)



Senegal

CANNED FISH INDUSTRY:

One of the purposes of Senegal's first 4-year development plan, which ended July 1, 1965, was the establishment of a fish-canning industry.

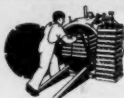
Senegal now has 5 fish-canning plants with a total processing capacity of about 30,000 metric tons. But it is estimated that Senegal's 1964 production of canned fish amounted to only about 15,000 tons, almost all of which was canned tuna. Senegal hopes to expand tuna exports to Europe and North America. One Senegalese cannery has decided to pack sardines, of which about 2,000 tons annually are landed at Dakar. The firm plans to can sardines in either oil or tomato sauce for African markets, and sardine fillets for export to Europe.

Senegal (Contd.):

Fish processing is also carried out in Senegal by a number of small firms which are engaged mainly in smoking, salting, and cooking fishery products.

Senegal's fishing fleet comprises three groups: proas (Malay-type sailing vessels), tuna vessels, and trawlers. Of the country's present annual catch of about 100,000 tons, about 80,000 are taken by proas, 15,000 by tuna vessels, and 5,000 by trawlers. (The Fishing News, June 18, 1965.)

Note: See Commercial Fisheries Review, Jan. 1965 p. 86 and Feb. 1965 p. 82.



South Africa

PRODUCTION OF LEADING PROCESSED FISHERY PRODUCTS, 1963-1964:

Record production of fish meal and fish-body oil in 1964 was reported by the South

Production of Leading Processed Fishery Products in the South Africa Republic and the Territory of South-West Africa, 1963-1964

Product	Unit	South Africa		South-West Africa		Total South Africa and South-West Africa	
		1964	1963	1964	1963	1964	1963
Canned:							
Pilchard	Short tons	2,332	8,445	82,130	32,053	64,462	40,498
Masbanker	"	1,527	2,090	-	-	1,527	2,090
Mackerel	"	8,152	1,719	-	-	8,152	1,719
Spiny lobster . . .	"	-	1/1	184	1/1	184	1/1
Frozen:							
Spiny lobster tails	Short tons	2/3,325	1/1	2,730	1/1	6,055	1/1
Pilchard	"	-	-	1,020	-	1,020	-
Industrial:							
Fish meal	Short tons	106,803	3/1	175,186	3/1	283,989	4/262,600
White fish meal . .	"	9,320	1/1	-	-	9,320	1/1
Fish-body oil	Long tons	21,957	3/1	48,159	3/1	70,916	4/45,878
Whale oil	"	4,122	5,886	-	-	4,122	5,886
Sperm oil	"	10,778	10,780	-	-	10,778	10,780
/ Data not available.							
/ Information not available.							
/ Stocked not available.							

1/ Data not available.
2/ Estimated.
3/ Breakdown not available.
4/ Shorted.



Fig. 1 - Unloading South African frozen spiny lobster tails at New York City dock.



Fig. 2 - A pilchard-masbanker cannery and industrial products plant situated on the St. Helena Bay Coast.

Africa Republic (includes the Territory of South-West Africa). There was also a sharp increase in the 1964 pack of canned pilchard. Those increases were due mainly to greater production in South-West Africa.

In 1964, whale oil output was down, while sperm oil production was at about the same level as in 1963. (United States Consulate, Cape Town, July 2, 1965; and other sources.)

Note: See Commercial Fisheries Review, Nov. 1964 p. 110.



South Africa Republic

SHARK FISHERY EXPANDS:

Shark fishing is becoming an increasingly important industry off the Cape coast. Four fishing vessels of one firm unloaded about 2,400 sharks in Cape Town during a week in June 1965. A spokesman for the firm said the sharks were being exported to Italy. (South African Digest, June 25, 1965.)

Note: See Commercial Fisheries Review, June 1965 p. 78.



Spain

FROZEN FISH WINS CONSUMER ACCEPTANCE:

Frozen hake is becoming increasingly popular in Spain. Marketing has been added by the efforts of freezer-trawler operators and retail fish markets to deliver a high-quality product.

The growing use of freezer-trawlers by Spanish firms is rapidly increasing the supply of frozen fish. (Fisheries landings at the

Spain (Contd.):

port of Vigo in January-March 1965 included 8,550 metric tons of frozen fish--mostly small hake--which was more than double the frozen fish landings at Vigo in the first quarter of 1964.)

In keeping with the current trend, retail fish markets in southern Spain have added special stalls for the sale of "frozen-on-board-ship" hake. Each stall has a large frozen-storage cabinet and an electric band-saw. This allows the customer to buy cut-to-order frozen steaks. The frozen headless hake (which weigh from about 1 to 5 pounds) are usually sliced into steaks about $\frac{1}{2}$ -inch thick. They are sliced with an oblique cut which gives a larger steak than the regular cross-section cut. The retail price of the hake range from about 24.5 U.S. cents a pound for the smaller sizes to 38.5 cents a pound for the larger sizes.

The new fishing and marketing techniques are changing the long-established "fresh-fish" preference of Spanish housewives. (Fish Trades Gazette, London, June 19, 1965.)



Taiwan

TUNA VESSEL CONSTRUCTION MATERIALS TO BE PURCHASED FROM JAPAN:

The Formosan Government is planning the construction of 15 200-ton tuna vessels with the construction materials to be purchased from Japan. Under the plan, all the shipbuilding materials, including marine engines, will be imported from Japan and assembled in Formosa. The Cooperative Bank of Formosa is said to have committed a 60-percent vessel construction loan totaling 60 million yen (US\$1.5 million) for this program. (Suisan Keizai Shimbun, July 2, 1965.)

TUNA VESSELS ORDERED FROM JAPAN:

A Japanese fishing vessel shipbuilding firm has received a construction order for 20 distant-water tuna vessels from Taiwan. Details are not available and the Japanese shipbuilding firm denies having received such an order, but it is reported that a number of Japanese trade representatives in Taiwan filed similar reports concerning the placement of such a

vessel order. (Suisan Keizai Shimbun, July 20, 1965.)



U.S.S.R.

FREEZER-TRAWLERS "PAVLOVO" AND "PRILUKI" BUILT FOR SOVIETS BY DANISH SHIPYARD:

The freezer-trawlers M/S Pavlovo and M/S Priluki were launched June 29, 1965, by a shipyard in Copenhagen, Denmark, for V/O Sudoimport, Moscow. The vessels are part of a series of 15 freezer-trawlers for the U.S.S.R. being built by the Danish shipyard



The M/S Pavlovo and M/S Priluki in construction dock at Copenhagen.

to the following specifications: length between perpendiculars 91 meters (298.5 feet), breadth 16 meters (52.5 feet), and deadweight tonnage 2,550 to 2,600 metric tons. The first in the series was the M/S Skryplev launched May 10, 1962. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, July 14, 1965.)

Note: See Commercial Fisheries Review, June 1965 p. 79.

U.S.S.R. (Contd.):

BIG INCREASE IN FISHING FLEET AND CATCH PLANNED DURING 1966-70:

The Soviet Union is reported to be finishing the blueprint for the development of her fishing fleet under the 5-Year Plan 1966-1970. During that period, additions are to include over 200 support vessels such as freezer-ships, transport vessels, factoryships, and motherships. Emphasis will be on the 43,000-ton displacement Vostock-class motherships. In addition, over 13 different types of fishing vessels will be constructed, including a large factory-trawler (with a displacement of about 7,000 tons) powered by an engine developing 6,000 horsepower and providing a cruising speed of 14 knots. The large trawler will carry freezing and canning equipment.

The Soviet Fisheries Minister announced in an article in *Vodnii Transport*, July 1965, that the increased number of fishing vessels and continued expansion into new fishing areas are expected to allow the U.S.S.R. to bring her yearly catch to 10 million metric tons by 1970, almost double the 1964 catch.

**United Kingdom****NEW FREEZER-TRAWLER "VICTORY" LANDS BLOCKS OF WHOLE FROZEN FISH:**

After completing her maiden voyage on June 11, 1965, the new British stern-fishing freezer-trawler *Victory* delivered to Grimsby a catch of almost 540 long tons of ground-fish, most of which was frozen into blocks of whole fish. Included were 11,074 frozen blocks of cod, 464 of lingcod, 346 of ocean perch, 252 of catfish, and 258 of unclassified fish. The fish blocks were unloaded with an elevator-conveyor unit similar to that used to unload bananas from cargo vessels.

The *Victory* is the first of 6 large freezer-trawlers ordered from British shipyards by a British fisheries group at a cost of about £3.0 million (US\$8.4 million).

The *Victory* is equipped with 10 vertical-plate freezers. It has a diesel-electric propulsion system which develops 2,700 b. hp. Main specifications of the vessel are length overall 244½ feet, length between perpendiculars 215 feet, moulded depth



Fig. 1 - New freezer-trawler *Victory* docked at Grimsby.



Fig. 2 - Frozen blocks of whole fish being unloaded from *Victory*. Note elevator-conveyor unit used to remove blocks from the vessel.

to upper deck 27½ feet, and moulded breadth 41 feet.

Note: See *Commercial Fisheries Review*, May 1964 p. 73; March 1964 p. 76.

United Kingdom (Contd.):

FREEZER-TRAWLERS EMPHASIZED IN DISTANT-WATER FISHERIES:

A total of 22 British freezer-trawlers should be operating by mid-1966. The search for increased productivity to overcome declining yields has led the British to emphasize freezer-trawlers for distant-water fishing. The British White Fish Authority has contributed substantially to the heavy capital investment involved in changing to freezing at sea. During the fiscal year ending March 31, 1965, White Fish Authority grants to the distant-water fleet totaled nearly £1.25 million (US\$3.5 million) and loans £113,000 (\$316,400). It is expected that the use of those vessels will arrest the declining catch of the distant-water fleet, which fell by 8 percent to 336,000 long tons during the past fiscal year, and result in greater price stability.

A strong plea for the control of fishing in international waters was made on June 30, 1965, by the Chairman of the White Fish Authority, as he presented the Authority's report for the year ending March 31, 1965. He said that stocks of fish in North Atlantic waters were being hard hit by a rapid growth in the fishing effort, particularly by Soviet-Bloc countries, and that this not only depleted the stocks but increased fishing costs. (United States Embassy, London, July 9, 1965.)

* * * * *

CONFERENCE ON DESIGN OF FISHING VESSELS AND THEIR EQUIPMENT IN RELATION TO FISH QUALITY IMPROVEMENT:

A Conference on the Design of Fishing Vessels and Their Equipment in Relation to Improvement of Quality was held in London, May 31-June 1, 1965, under the sponsorship of the British White Fish Authority. Over 200 delegates attended, giving representation to most European countries, the United States, and several more distant areas. The Conference coincided with the 1965 World Fishing Exhibition in London. The meeting focused on ways to maintain fish quality on vessels at sea. Sessions of the meeting were devoted to the following topics:

(1) Design and operation of fishing vessels for stowing the catch on melting ice. (Fish handling, stowage, and unloading were discussed as well as vessel design.)

(2) Other chilling techniques such as chilled sea water, superchilling, antibiotic ice, and gas stowage.

(3) Freezer trawlers and their equipment.

(4) Factory trawlers and motherships. (The discussion extended to the freezing of whole fish and fillets at sea, offal processing, and the economic size of factoryships and catcher vessels.)

The subject under discussion at each session was developed by introductory papers and then amplified by allied papers, comments, and a general discussion. The scientific approach in the introductory papers was balanced by comments of fishing industry and manufacturers representatives.

The discussions at the Conference brought out some of the trends in fish preservation at sea on European vessels. On short trips, bulk stowage of fish in ice is still the general practice, but boxing fish at sea is winning favor. Good results with antibiotic ice were reported by one trawler fleet operator. Stowage in chilled sea water is not making any advance. It was pointed out that transferring catches at sea may affect quality if the catch remains long in the sea before being picked up.

Freezing fish at sea is well accepted as a means of producing quality fish, but there is disagreement over techniques. Freezing whole fish at sea is the usual method of British freezer trawlers, while operators from most other European countries favor processing and freezing fillets at sea. Superchilling the catch as an alternative to freezing fish at sea may be useful on some vessels working in the North Atlantic. The Portuguese have tried superchilling fish by bulk stowage of fish in ice on freezer plates. British engineers recommend a method of superchilling which circulates cold air over boxed fish.

Delegates also said that more automation in fish handling is needed on shipboard as well as when unloading ashore. It was noted that shore auctions of fish may diminish in importance as boxing and freezing at sea increase. It was pointed out that fleet operations are an efficient way to produce quality fish at long distances from port. This may favor certain countries such as Japan, the U.S.S.R., Spain, and Portugal whose fishermen have experience in spending long periods

United Kingdom (Contd.):

at sea. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, June 23, 1965.)

Note: See Commercial Fisheries Review, April 1965 p. 88.

FISHING EXHIBITION HELD IN LONDON:

A British trade periodical presented a 1965 World Fishing Exhibition in London, May 27-June 2, 1965. It was sponsored by a number of British fishery associations and open only to members of the fishing industry. Over 200 exhibitors from a dozen countries displayed fishing gear, vessel models and designs, marine engines, deck machinery, electronic navigating and fish-finding devices, and refrigerating and processing equipment.

The industrial exhibits covered practically all phases of the fishing industry. Many exhibits showed new or improved products. There were numerous displays of transistorized electronic devices. Visitors to the exhibition were particularly interested in labor-saving devices such as automated engines and deck machinery; filleting, freezing, and fish-meal processing equipment; and new fish boxes made of aluminum, plastic, and folding woven wire.

A number of exhibits by agencies of the British Government illustrated their work with the fishing industry to provide loans and grants, assist in orderly marketing, conduct exploratory fishing and gear studies, and carry out technological and biological research.

The Soviet Bloc was represented by an East German exhibit of a flake-ice machine and models of fish-reduction and fish-freezing equipment used on freezer trawlers. The East German ice machine was said to have an output of 10 metric tons of flake ice every 24 hours from either fresh or sea water. The East Germans displayed a model of a reduction plant said to have a daily capacity for 35 tons of fish or offal, and requiring only one operator on shipboard or ashore. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, June 23, 1965.)

RADIATION-PRESERVATION OF FROZEN FISH UNDER STUDY:

A British program of research into the effects of eating fish preserved by irradiation is being carried out at the Wantage Research Laboratory, with the backing of the White Fish Marketing Board.

The Low Temperature Research Station at Cambridge has already determined the dose of radiation needed to keep fish palatable for 20 or 30 days, or 4 to 5 times ordinary shelf life. It is applied by passing the packaged fish at freezing point through an irradiation unit.

The aim of the present study, which is scheduled to continue through 1966, is to satisfy the British Ministry of Health that there would be no harmful effects if treated fish were used generally. Experimenters report the irradiated fish tastes "far better than anything in the average canteen."

If the study can be completed ahead of schedule, radiation-preserved fish with a low spoilage rate may appear on the British market before the end of 1966. (The Fishing News, London, July 2, 1965.)

FISHERY LOAN INTEREST RATES REVISED:

The British White Fish Authority announced that their rates of interest on loans made as from May 8, 1965, would be as follows:

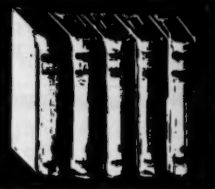
For fishing vessels of not more than 140 feet, new engines, nets and gear: on loans for not more than 5 years, $7\frac{1}{4}$ percent (decrease $\frac{1}{8}$ percent); on loans for more than 5 years but not more than 10 years, $7\frac{1}{4}$ percent (increase $\frac{1}{8}$ percent); on loans for more than 10 years but not more than 15 years, $7\frac{1}{4}$ percent (increase $\frac{1}{8}$ percent); on loans for more than 15 years but not more than 20 years, $7\frac{1}{4}$ percent (increase $\frac{1}{8}$ percent).

The rates on advances made before May 8, 1965, are unchanged. (Fish Trades Gazette, London, May 22, 1965.)

Note: See Commercial Fisheries Review, June 1965 p. 80.



FEDERAL ACTIONS



Agency for International Development

CALIFORNIA FIRM GETS GUARANTEES FROM AID FOR AFRICAN PROJECTS:

Two investment guarantees have been issued by the Agency for International Development (AID) to Star-Kist Foods, Inc., Terminal Island, Calif., which is establishing fish refrigeration plants in Liberia and Senegal.

The guarantees insure the firm against inconvertibility of local currencies and against loss from expropriation, war, revolution, and insurrection.

The refrigeration plants will help in marketing fish products locally, but they are designed primarily for storage prior to shipment.

The plants will meet economic assistance objectives of AID by increasing the availability of protein food, providing steady employment to local labor, and saving scarce foreign exchange.

In Senegal, Star-Kist will hold approximately a 25-percent interest as one of three partners in Frigorifique du Senegal S. A., Dakar. The total amount of AID risk coverage to Star-Kist in Senegal is \$340,500.

The other investment is a joint ownership with two partners in the Liberia Cold Stores, Inc., Monrovia, Liberia. The total amount of coverage under this guaranty is \$350,000. (Agency for International Development, July 20, 1965.)



Department of the Interior

BUREAU OF INDIAN AFFAIRS

PROPOSED REGULATIONS APPLICABLE TO OFF-RESERVATION INDIAN TREATY FISHING:

Notice was published in the Federal Register, July 16, 1965, of a proposal to amend

Title 25, Code of Federal Regulations, by adding a new part 255--Off-Reservation Treaty Fishing. The purpose of the proposed regulations is "to provide a framework within which the exercise of off-reservation fishing rights reserved to certain Indian tribes under treaties with the United States may be subjected to Federal restrictions and controls wherever required for conservation of the fishery resources."

The proposed regulations contain provisions which would provide, among other things, for the issuance of (1) off-reservation treaty fishing permits; and (2) "conservation regulations to govern Indian off-reservation treaty fishing for areas found . . . to be in need of Federal restrictions on Indian fishing as a means of assuring the conservation and wise utilization of the fishery resources for the benefit of the Indians and other persons entitled to the enjoyment thereof."

The proposed regulations provide that off-reservation treaty fishing permits shall be issued only to Indians who are members of a "recognized Indian tribe having off-reservation treaty fishing rights."

Following are the proposed regulations as published in the Federal Register, July 16, 1965:

DEPARTMENT OF THE INTERIOR

Bureau of Indian Affairs

[25 CFR Part 255]

OFF-RESERVATION TREATY FISHING

Notice of Proposed Rule Making

Notice is hereby given, pursuant to section 4(a) of the Administrative Procedure Act of June 11, 1946 (60 Stat. 237), that the Secretary of the Interior proposes to amend Title 25, Code of Federal Regulations, by adding a new Part 255--Off-Reservation Treaty Fishing. The proposed regulations are set forth in tentative form below.

The proposed regulations are to be adopted under the authority contained

in section 22, Title 5, United States Code, and sections 2 and 9, Title 25, United States Code, and are intended to provide a framework within which the exercise of off-reservation fishing rights reserved to certain Indian tribes under treaties with the United States may be subjected to Federal restrictions and controls wherever required for conservation of the fishery resources.

Prior to the final adoption of the proposed regulations, consideration will be given to any data, views, or suggestions pertaining thereto which are submitted in writing to the Commissioner of Indian Affairs, Department of the Interior, Washington, D.C., 20242, within the period of 30 days from the date of publication of this notice in the *FEDERAL REGISTER*.

The new Part 255 reads as follows:

- Sec.**
 255.1 Purpose.
 255.2 Definitions.
 255.3 Off-reservation treaty fishing permits.
 255.4 Unauthorized use of permit cards—only permittees to fish.
 255.5 Possession of permit card.
 255.6 Identification of fishing equipment.
 255.7 Area regulations.
 255.8 Enforcement.
 255.9 Savings provisions.

AUTHORITY: The provisions of this Part 255 issued under 25 U.S.C. 2 and 9; 5 U.S.C. 22.

§ 255.1 Purpose.

(a) The purposes of these regulations are:

- (1) To assist in promoting the development, management, conservation, and protection of the Nation's fisheries resources;
- (2) To assist in protecting the off-reservation fishing rights which were reserved to certain Indian tribes under their treaties with the United States;
- (3) To assist in the orderly administration of Indian affairs;
- (4) To remove uncertainties resulting from recent Federal and State court decisions over the precise fishing restrictions with which Indians with treaty rights must comply;
- (5) To assist the States in enforcing their laws and regulations for the conservation of fish and wildlife to the extent permitted under any Federal law or treaty applicable to off-reservation fishing activities of Indians; and
- (6) To facilitate consultation and cooperation between the States and the Indian tribes in the management and improvement of fisheries resources affected by such Federal laws or treaties.

(b) The following conservation regulations are found to be necessary to assure that the nonexclusive rights reserved to certain Indians by treaty to fish at usual and accustomed places outside the boundaries of an Indian reservation shall be protected and preserved for the benefit of present and future members of such tribes and in a manner consistent with the nonexclusive character of such rights. Any exercise of an Indian off-reservation treaty fishing right shall be in accordance with these regulations, except as may be otherwise authorized by tribal regulation approved by the Secretary of the Interior or his designee or permitted by less restrictive requirements of State law.

§ 255.2 Definitions.

As used in these regulations:
 (a) "enforcement officer" means (1) any special officer of the Bureau of In-

dian Affairs, U.S. Game Management Agent, U.S. Fishery Management Agent or any other officer or employee of the Department of the Interior or any Indian tribe authorized by the Secretary of the Interior to enforce these regulations, and (2) any officer of any State or political subdivision thereof authorized to enforce State fish or game laws if there is in effect an agreement between the Secretary of the Interior and the fish or game management agency or agencies of such State for the recognition and enforcement of these regulations;

(b) "Off-reservation treaty fishing permit," "permit," or "permit card" mean a permit or card issued pursuant to § 255.3;

(c) "Off-reservation treaty fishing rights" or "right" mean any right reserved or granted to one or more Indian tribes, bands, or groups by treaty with the United States to take, cure, or possess fish at usual and accustomed places outside the boundaries of an Indian Reservation in common with others;

(d) "These regulations" means the regulations comprising this Part 255 of Title 25 of the Code of Federal Regulations together with any regulations adopted pursuant to § 255.7, and any additions thereto or amendments thereof.

§ 255.3 Off-reservation treaty fishing permits.

(a) Subject to the provisions of these regulations, the Commissioner of Indian Affairs or his designee shall, upon application therefor, issue an Indian off-reservation treaty fishing permit to any Indian whom he finds to be a member of a recognized Indian tribe having off-reservation treaty fishing rights. Such permits shall be issued for periods of not to exceed 5 years and shall be renewed upon application so long as the holder remains entitled to off-reservation fishing rights.

(b) Effective January 1, 1968, no such permit shall be issued to any person who is not on an official membership roll of the tribe which has been approved by the Secretary of the Interior. Prior to that date, the Commissioner of Indian Affairs or his designee may issue such a permit to any person who submits evidence of his entitlement thereto satisfactory to the issuing officer. Any person claiming to have been wrongfully denied a permit may appeal the decision of the issuing officer to the Commissioner of Indian Affairs.

(c) Each permit card shall be evidence that the lawful holder is entitled to the off-reservation treaty fishing rights identified in said permit, to be exercised as provided in these regulations.

(d) No charge or fee of any kind shall be imposed for the issuance of an off-reservation treaty fishing permit, provided that this shall not prevent any Indian tribe from imposing any fee or tax upon the exercise of any tribal fishing right.

(e) No person shall be issued a permit or permits on the basis of membership in more than one tribe at any one time.

(f) All permit cards issued pursuant to these regulations shall be and remain the property of the United States and may be retaken by any enforcement officer from any unauthorized holder (including the permittee during any period for which the permit may have been sus-

pended or revoked pursuant to these regulations). Any card so retaken shall be immediately forwarded to the officer who issued it.

(g) Each permit card issued under these regulations shall specify the period for which it is effective and shall state the name, address, tribal affiliation and enrollment number (if any) of the holder, identify the treaty under which the holder is entitled to fishing rights, contain such additional personal identification data as may be required on fishing licenses issued under the law of the State or States within which it is valid, and be signed by the issuing officer and countersigned by holder.

(h) Upon the revocation or suspension of the off-reservation treaty fishing privileges of the holder of a permit by any court of Indian Offenses or tribal court for violation of any tribal fishing ordinance incorporating or adopting the regulations in this Part 255 and approved by the Secretary of the Interior, any such permit-issued hereunder may be revoked or suspended for a like period. No permit shall be issued to any person whose off-reservation treaty fishing privileges may have been suspended or revoked by such court, during the period of such suspension or revocation.

§ 255.4 Unauthorized use of permit cards—only permittees to fish.

(a) No permit holder shall allow any use of his permit card by any other person. Any use of another's permit card by any Indian subject to these regulations shall constitute a violation of these regulations.

(b) Whenever exercising off-reservation treaty fishing rights no Indian shall allow anyone other than a holder of a currently valid permit under these regulations to fish for him, to use gear marked pursuant to these regulations, or to assist him in fishing.

§ 255.5 Possession of permit card.

Any Indian fishing under an off-reservation treaty fishing right shall have a currently valid off-reservation treaty fishing permit card in his immediate personal possession while so fishing, or while having in his possession outside an Indian reservation any fish so caught. He shall upon demand display the permit card to any enforcement officer.

§ 255.6 Identification of fishing equipment.

All fishing gear or other equipment used in the exercise of any off-reservation treaty fishing right and not in the immediate personal possession of such Indian shall be marked in such manner as shall be prescribed in regulations issued pursuant to § 255.7 to disclose the identity of its owner or user.

§ 255.7 Area regulations.

(a) The Commissioner of Indian Affairs and the Commissioner of Fish and Wildlife shall from time to time jointly recommend to the Secretary of the Interior specific conservation regulations to govern Indian off-reservation treaty fishing for areas found by them to be in need of Federal restrictions on Indian fishing as a means of assuring the conservation and wise utilization of the fishery resources for the benefit of the Indians and other persons entitled to the enjoyment thereof. Such regulations shall be designed to prevent, in conjunc-

tion with appropriate State conservation regulations governing fishing by persons not fishing under treaty rights, the depletion or impairment of the fishery resources.

(b) In formulating their recommendations for regulations to be promulgated by the Secretary of the Interior, the two Commissioners shall seek the views of the affected Indian tribes, of the fishery conservation agency of any affected State, or of other interested persons as may desire to participate in the proposed rule making. A general notice of proposed rule making shall be published in the *FEDERAL REGISTER* to afford interested persons an opportunity to participate in the rule making through submission of written data, views, or arguments with or without opportunity to present the same orally as may be determined by the Secretary of the Interior. Following the expiration of the time allowed for the submission of written data, views, or arguments, the final recommendations of the Commissioners shall be submitted to the Secretary of the Interior for appropriate action. Such of the recommended regulations or modifications thereof as the Secretary shall adopt shall become effective on such date as the Secretary of the Interior shall prescribe.

(c) Any regulations issued pursuant to this section shall contain provisions for invoking temporary emergency closures or restrictions or the relaxation thereof

at the field level when necessary or appropriate to meet conditions not foreseeable at the time the regulations were issued.

(d) Regulations issued pursuant to this § 255.7 may include such requirements for recording and reporting catch statistics as the Secretary of the Interior deems necessary for effective fishery management.

§ 255.8 Enforcement.

(a) Any fishing or related activity which is contrary to the provisions of the regulations in this Part 255 and the laws of the State in which it occurs shall be deemed to be outside the scope of any off-reservation treaty fishing rights, and the offender shall be subject to arrest and prosecution under State law: *Provided*, That this paragraph (a) shall not apply to Indians fishing within any Indian reservation or within reservation boundary waters in which an Indian tribe has exclusive fishing rights.

(b) Any unattended fishing gear which is not marked or labeled for identification as required by the regulations in this Part 255 shall be presumed not to be used in the exercise of an off-reservation treaty fishing right and shall be subject to control or seizure under State law.

§ 255.9 Savings provisions.

Nothing in these regulations (25 CFR Part 255) shall be deemed to:

(a) Prohibit or restrict any person from engaging in any fishing activity in any manner which is permitted under State law;

(b) Deprive any Indian or any Indian tribe, band or group of any right which may be secured to him or to it by any treaty or other law of the United States;

(c) Permit any Indian to exercise any tribal fishing right in any manner prohibited by any ordinance or regulation of his tribe;

(d) Enlarge the right, privilege, or immunity of any person to engage in any fishing activity granted or reserved by treaty with the United States;

(e) Exempt any person or any fishing gear, equipment, boat, vehicle, fish, or fish products, or other property from the requirements of any law or regulation pertaining to safety, obstruction of navigable waters, national defense, security of public property, pollution, health and sanitation, or registration of boats or vehicles; or

(f) Abrogate or modify the effect of any agreement affecting fishing practices entered into between any Indian tribe and the United States, or any State, or agency of either.

JOHN A. CARVER, Jr.,
Under Secretary of the Interior.

July 5, 1965.



U.S. Tariff Commission

STUDY OF FREE ENTRY OF TEMPORARY IMPORTS-- PUBLIC COMMENTS INVITED:

The U. S. Tariff Commission has begun a study of various statutory provisions included in title 19 of the United States Code. Included are those provisions permitting the temporary importation into the United States of merchandise without the payment of ordinary duties, or permitting a virtual recovery of duties paid when the imported merchandise or its domestic equivalent is exported either in its original form or in a changed condition.

Without excluding other sections, the study includes in whole or in part the following sections of title 19 of the U. S. Code: Section 81- Foreign Trade Zones; Section 1202- (Schedule 8, Part 5C) Temporary Free Entry under Bond; Section 1311-Bonded Manufacturing Warehouses; Section 1312-Bonded Smelting and Refining Warehouses; Section 1313-Drawback and Refunds; Section 1555-Bonded Warehouses; Section 1557-Entry for Warehouse--Warehouse Period--Drawback; Section 1562-Manipulation in Warehouse.

The study will review the original objectives of each provision, examine the extent to which each provision is now accomplishing its purposes, and determine the impact each provision has on U. S. international trade. The Commission is especially interested in whether the economic forces which led to the creation of those programs have so changed in the intervening years as to warrant modification and possible consolidation of the procedures to meet current conditions.

Interested parties should file their comments with the Secretary, U. S. Tariff Commission, Washington, D. C., no later than November 1, 1965.

At the conclusion of a preliminary study of all comments and all other pertinent information, the Commission will publish a resume of the results of the preliminary study, together with any proposals for revision of the present statutes. Public notice will be given thereafter of a hearing to be held by the Tariff Commission to permit all interested parties to be present, to produce evidence, and to be heard regarding any proposed revisions. (U. S. Tariff Commission, July 26, 1965.)



United States District Court

CERTAIN GULF SHRIMP FISHERMEN HELD TO BE INDEPENDENT CONTRACTORS FOR TAX PURPOSES:

On June 9, 1965, in three separate tax refund cases (*Thompson Enterprises, Inc. v. United States*; *W. G. Wells, et al v. United States*; and *John Fernandez, et al v. United States*), the United States District Court for the Southern District of Florida concluded as a matter of law that shrimp captains and crewmen working on a share basis on plaintiffs' shrimp trawlers were not employees, but independent contractors for Federal employment tax purposes.

Note: See *Commercial Fisheries Review*, June 1965 p. 83.



Eighty-Ninth Congress (First Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.



ANADROMOUS FISH CONSERVATION: *Anadromous Fish--1965:* Hearings before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries, House of Representatives, 89th Congress, 1st session, on Hudson River Spawning Grounds, May 10, 11, 1965, H. R. 23, H. R. 24, H. R. 2634, and H. R. 4349, bills to authorize the Secretary of the Interior to initiate a program for the conservation, development, and enhancement of the Nation's anadromous fish in cooperation with the several states; H. R. 3927, H. R. 800, H. R. 2399, and H. R. 3798, to authorize the Secretary of the Interior to initiate with several states a cooperative program for the conservation, development, and enhancement of the Nation's anadromous fish, and for other purposes; June 2, 3, 1965, Serial No. 89-9, 219 p., printed. Contents include statements, reports, and letters from various state and Federal officials, members of Congress, and representatives from various associations and business firms.

ANTIDUMPING ACT AMENDMENT: H. R. 9805 (McMillan) introduced in House July 13, 1965, to amend the Antidumping Act, 1921; to Committee on Ways and Means.

ANTIDUMPING INTERNATIONAL PROCEDURES: S. Res. 133 (Javits), introduced in Senate July 28, 1965, expressing the sense of the Senate that the President immediately take such action as may be necessary to convene a conference of the major trading nations, and other interested states, to conclude a multilateral agreement harmonizing the antidumping laws and procedures of all nations; to Committee on Finance.

ECOLOGICAL RESEARCH AND SURVEY: S. 2282 (Nelson) introduced in Senate July 13, 1965, to authorize the Secretary of the Interior to conduct a program of research, study, and surveys, documentation and description of the natural environmental systems of the United States for the purpose of understanding and evaluating the condition of these systems and to provide information to those concerned with natural resources management, and for other purposes; to Committee on Interior and Insular Affairs. Includes a section authorizing participation in environmental research in surrounding oceans in cooperation with other countries or with international organizations.

FACTORY-FISHING VESSELS: H. R. 10215 (Tupper) introduced in House August 2, 1965, to assist the domestic commercial fishing industry through the construction of three advanced design factory-fishing vessels; to Committee on Merchant Marine and Fisheries.

FISHERIES LOAN FUND EXTENSION: H. Rept. 600, *Amending Fisheries Loan Act* (July 7, 1965, report from Committee on Merchant Marine and Fisheries, U. S. House of Representatives, 89th Congress, 1st session, to accompany S. 998), 12 pp., printed. Committee reported favorably without amendments. Discusses purpose, need, background, conclusion, and cost of the legislation; departmental reports; and changes in existing law.

House July 12, 1965, passed without amendment S. 998, extending and liberalizing terms of fisheries loans which may be made under the Fish and Wildlife Act, and cleared it for the President. Rep. Dingell in *Congressional Record* (pp. 15778-15783), July 12, 1965, pointed out that S. 998 would extend for 5 years the period during which the Secretary would be authorized to make loans; authorize \$20 million as initial capital; expand the program so as to provide loans for the purchase of new and used vessels; permit loans for vessels other than for those replacing an existing vessel or one lost to the fleet; amend the 1965 act to create a permanent fund.

Senate July 15, 1965, sent to the President S. 998.

On July 24, 1965, the President signed S. 998 (P. L. 89-85).

FISHERMEN'S COOPERATIVE ASSOCIATIONS BANK: H. R. 9845 (Brown of Calif.) introduced in House, July 14, 1965, to provide credit facilities for the use of fishermen's cooperative associations through establishment of a Bank for Fishermen's Cooperative Associations, and for other purposes; to Committee on Merchant Marine and Fisheries.

FISHERMEN'S PROTECTIVE ACT AMENDMENT: H. R. 9810 (Wilson) introduced in House July 13, 1965, to amend the act of Aug. 27, 1954, relating to the seizure of vessels of the United States by foreign countries; to Committee on Merchant Marine and Fisheries. Rep. Wilson in *Congressional Record* (pp. 1596-1597), July 13, 1965, pointed out that the bill would amend the Fishermen's Protective Act so that the owner of any detained

American-flag vessel will be reimbursed by the Secretary of the Treasury for all costs, including demurrage.

FISHERMEN'S ORGANIZATION AND COLLECTIVE BARGAINING: Subcommittee on Merchant Marine and Fisheries of Senate Committee on Commerce met Aug. 5, 1965, on S. 1054, assuring bargaining rights of fishermen's organizations in the ex-vessel sale of fish on which the livelihood of their members depend.

FISHING LIMIT OF 12 MILES: Sen. Bartlett in Congressional Record (p. 15384), July 8, 1965, pointed out that in Japan his bill (S. 2218) has been criticized as being contrary to international law and to international custom. The facts do not support such statements. There is no international law establishing proper breadths for territorial seas.

Sen. Gruening in Congressional Record (pp. 16077-16079), July 13, 1965, spoke in the Senate regarding "Action To Establish the 12-Mile Limit for Our Fisheries Gains Support: It is Overdue." He inserted "Proclamation 2668--Policy of the United States with Respect to Coastal Fisheries in Certain Areas of the High Seas, By The President of the United States of America," "Executive Order 9633--Reserving and Placing Certain Resources of the Continental Shelf Under the Control and Jurisdiction of the Secretary of the Interior"; and Executive Order 9634; all issued by President Truman. Same day Rep. Wilson (Calif.) in extension of remarks inserted (p. A3715) an editorial from San Diego Union of July 1, 1965, "Twelve-Mile Coastal Limit is Excellent Beginning."

FOOD MARKETING NATIONAL COMMISSION: House, August 2, 1965, received a letter from the Chairman, National Commission on Food Marketing, transmitting interim report of the National Commission on Food Marketing, July 1, 1965, pursuant to Public Law 88-354; to Committee on Agriculture.

HALIBUT COMMISSION: S. Rept. 383, Offices For The International Pacific Halibut Commission (June 30, 1964, report from the Committee on Commerce, U. S. Senate, 89th Congress, 1st session, to accompany S. 1975), 8 pp., printed. Committee reported favorably with amendment. Discusses purpose, background, and need for legislation; cost; changes in existing law; Federal agency comments; and text of North Pacific Halibut Act of 1937, as amended.

House July 8, 1965, received Senate-passed S. 1975, an act to amend the Northern Pacific Halibut Act in order to provide certain facilities for the International Pacific Halibut Commission; to Committee on Merchant Marine and Fisheries. Also, July 9, H. R. 9734 (Pelly); July 13, H. R. 9801 (Adams); July 29, H. R. 10174 (Meeds); to Committee on Merchant Marine and Fisheries; all similar to S. 1975. Purpose is to authorize \$500,000 to construct facilities needed by the Commission. Rep. Meeds pointed out in Congressional Record (p. 18078) July 29, the necessity for the facilities and remarked on the Commission's work in conserving the North Pacific halibut resources.

HEALTH, EDUCATION, AND WELFARE APPROPRIATIONS, FY 1966: Subcommittee, in executive session, July 27, 1965, approved for consideration of full Senate Committee on Appropriations H. R. 7765, fiscal 1966 appropriations for the Departments of Labor and Health, Education, and Welfare, and related agencies. Includes funds for botulism research under the Food and Drug Administration; water pollution control under

Office of the Secretary; pesticide activities, water supply and water pollution control, shellfish sanitation program, and botulism under the Public Health Service.

MARINE AND ATMOSPHERIC AFFAIRS COORDINATION ACT OF 1965: S. 2251 (Muskie and 17 others) introduced in Senate July 7, 1965, to coordinate the major civilian marine and atmospheric functions of the Federal Government through the establishment of a Department of Marine and Atmospheric Affairs, to enunciate national policies pertinent to the marine and atmospheric interests of the United States, to further the expanded exploration of marine environs and the use of marine resources, to encourage research and development in the marine and atmospheric sciences and technologies, and for other purposes; to Committee on Government Operations. Would among other things, establish a Department of Marine and Atmospheric Affairs, which would include "the U. S. Maritime Administration, U. S. Coast Guard, U. S. Coast and Geodetic Survey, U. S. Weather Bureau, the National Oceanographic Data Center, the coastal Engineering Research Center, the Sea-Air Interaction Laboratory, the Central Radio Propagation Laboratory--all existing agencies--and a new Bureau of Marine Fisheries formed by the division of the fisheries responsibilities of the present Fish and Wildlife Service. A new coordinating office of Marine Geology and Mineral Resources would also be established. Also introduced in House July 27, H. R. 10106 (Hathaway); July 28, H. R. 10136 (Rivers of Alaska) and H. R. 10138 (Thompson of Texas); Aug. 3, H. R. 10231 (O'Neill of Mass.)

MARINE BIOLOGICAL LABORATORY: Senate Committee on Commerce July 19, 1965, submitted report (S. Rept. 463) on S. 1735 (without amendment).

S. Rept. 463, Land Use by U. S. Marine Biological Research Laboratory, La Jolla, Calif. (July 19, 1965, report from the Committee on Commerce, U. S. Senate, 89th Congress, 1st session, to accompany S. 1735), 5 pp., printed. Presents purpose of bill, agency reports, and cost.

Senate July 21, 1965, passed without amendment S. 1735, limiting use of certain University of California lands donated for a marine biological research laboratory. Sen. Mansfield pointed out in Congressional Record (pp. 17066-17067), July 21, 1965, that the purpose of the bill is to authorize and direct the Secretary of the Interior to reconvey certain lands to the University of California when those lands are no longer needed by the United States or when the United States ceases to use the land for more than 2 years exclusively for fishery and oceanography research purposes.

House July 22, 1965, received Senate-passed S. 1735; to Committee on Merchant Marine and Fisheries.

METRIC SYSTEM STUDY: Senate Committee on Commerce July 14, 1965, held hearings on S. 774, providing for a study to determine the practicability of adoption by the U. S. of the metric system of weights and measures. Hearings adjourned subject to call.

House Committee on Science and Astronautics held a hearing Aug. 3, 1965, on H. R. 2626, similar to S. 774.

MINIMUM WAGE: Subcommittee on Labor of Senate Committee on Labor and Public Welfare concluded its current series of hearings on S. 1986, to extend minimum wage coverage under the Fair Labor Standards Act, and other pending related bills (S. 763, 1741, 1770, and 2210).

Rep. Krebs inserted in Congressional Record (pp. A3947-3948) July 21, 1965, under extension of remarks, a discussion on "Minimum Wage Should be \$2 an Hour."

H. R. 10275 (Roosevelt) introduced in House Aug. 4, 1965, to amend the Fair Labor Standards Act of 1938 to extend its protection to additional employees, to raise the minimum wage, and for other purposes; to Committee on Education and Labor.

OCEANOGRAPHY: Subcommittee on Oceanography of House Committee on Merchant Marine and Fisheries held hearings August 3-12 on H. R. 921, 2218, 5654, 6487, 5175, 5884, 7849, and 9064, similar bills dealing with various approaches to oceanography in government.

OCEANOGRAPHIC AGENCY OR COUNCIL: Senate Committee on Commerce, July 15, 1965, in executive session, ordered favorably reported amended S. 944. Committee held another executive session on July 20, and on July 29, 1965, reported (S. Rept. 528) with amendments to Senate S. 944, to provide for expanded research in the oceans and the Great Lakes, to establish a National Oceanographic Council, and for other purposes. Senator Pell pointed out in Congressional Record (p. 18146), July 29, 1965, that as amended bill provides for a "National Council on Marine Resources and Engineering Development" staff at the Cabinet level, and that it will not disrupt the existing oceanographic agencies, but will provide them with coordination and high-level endorsement they require. At the same time, it calls for a self-liquidating Commission on Marine Science, Engineering, and Resources, to plan a broad outline, over an 18-month period, or proposed policy and direction.

Subcommittee on Oceanography of House Committee on Merchant Marine and Fisheries Aug. 3, 1965, held hearings on H. R. 921, and similar bills, dealing with variation of approach to the establishment of a comprehensive long-range and coordinated national program in oceanography; also held hearing on H. R. 5175, oceanography legal problems.

Sen. Murphy in Congressional Record (p. 18383), Aug. 3, 1965, spoke in the Senate, paying tribute to San Diego for its world leadership in the exploration and study of our oceans. One of the most significant contributions to date has been the launching of "Sealab II," the U. S. Navy's man-in-the-sea program. He continued: When the "Sealab II" underseas unit starts its experimental work later this month in actual underseas quarters on the ocean bottom one-half mile off the Institution of Oceanography at La Jolla, the Nation will see and hear regular televised broadcasts from "Sealab II" and the 210-foot deep quarters. Aquanauts in the quarters will carry out experimental salvage techniques, engage in oceanographic and marine biological research, and undergo a series of physiological and human performance tests. Also referred to legislation he introduced to provide expanded research and establish National Oceanographic Council; to S. 944 to coordinate Nation's overall efforts to explore the oceans and set up an Oceanographic Council; and Rep. Wilson's proposal to establish a National Oceanographic Year.

"OCEANOGRAPHIC" INVESTIGATIONS: Rep. Wilson in Congressional Record (pp. A4010-4011), July 22, 1965, in extension of remarks included the following article from the July 9, 1965, Free Cuba News: "Inside Cuba: Russia Extends 'Oceanographic' Investigations."

OCEANOGRAPHY LEGAL PROBLEMS: Subcommittee on Oceanography of House Committee on Merchant

Marine and Fisheries Aug. 3, 1965, held hearings on H. R. 5175, providing for a study of the legal problems of management, use, and control of the natural resources of the oceans and ocean beds. Also held hearing on H. R. 921, oceanographic agency or council.

OCEANOGRAPHIC RESEARCH VESSEL INSPECTION: H. Rept. 599, Exempting Oceanographic Research Vessels From the Application of Certain Vessel Inspection Laws (July 7, 1965, report from the Committee on Merchant Marine and Fisheries, U. S. House of Representatives, 89th Congress, 1st session, to accompany S. 627), 9 pp., printed. Committee reported favorably with amendments. Discusses purpose, background, amendments, and cost of the legislation; and Federal agency comments.

House July 12, 1965, passed and returned to Senate, with committee amendments, S. 627, to exempt oceanographic research vessels from the application of certain vessel inspection laws.

Senate July 19, 1965, concurred in House amendments to S. 627; this cleared bill for President's signature.

S. 627, to exempt oceanographic research vessels from the application of certain vessel inspection laws, was signed by the President July 30, 1965, P. L. 89-99.

PASSAMAQUODDY TIDAL POWER PROJECT: Senate July 12, 1965, received a communication from the President of the United States, transmitting, for the information of the Senate, reports on the Passamaquoddy tidal power project and the Upper St. John River hydroelectric development (with accompanying document); to Committee on Public Works. On same day House received the same communication (H. Doc. 236); to Committee on Public Works.

H. R. 9765 (Hathaway, Maine) and H. R. 9775 (Tupper, Maine) introduced in House July 12, to authorize a flood control project on the upper St. John River, and for other purposes; to Committee on Public Works. Rep. Hathaway inserted letters he wrote to the President and the Secretary of the Interior; also a letter from Secretary Udall to the President which spells out the proposals of the Secretary and which was approved by the President. Among the recommendations in Secretary's letter was one in which the Federal Government, in full participation with State and regional planning groups, would continue to intensify a comprehensive program already planned and initiated for the multiple use of the area's natural resources including, among others, fish and wildlife conservation, particularly by restoration of the Atlantic salmon fisheries.

TECHNOLOGICAL LABORATORY LAND IN MARYLAND: The Public Lands Subcommittee of Senate Committee on Interior and Insular Affairs July 9, 1965, in executive session, approved for full committee consideration S. 1988. Property affected includes the site of the Bureau of Commercial Fisheries Technological Laboratory, College Park, Md.

Senate Committee on Interior and Insular Affairs July 19, 1965, favorably reported and submitted report (S. Rept. 468) on S. 1988.

Senate July 21, 1965, passed with committee amendment S. 1988. Sen. Mansfield pointed out in Congressional Record (pp. 17068-17069), July 21, 1965, that the bill would authorize the Secretary of the Interior to convey to the State of Maryland approximately 14 acres of

land on the University of Maryland campus at College Park, Md., which was donated by the State of Maryland to the United States in 1935, and now occupied by the Bureau of Mines and the Fish and Wildlife Service.

House July 22, 1965, received Senate-passed S. 1988.

TERRITORIAL SEA AND CONTIGUOUS ZONE CONVENTION: H. R. 10177 (Rivers of Alaska) and H. R. 10183 (Pelly), introduced in House July 29, 1965, to establish a contiguous fishery zone beyond the territorial sea of the United States; to the Committee on Merchant Marine and Fisheries. Similar to other Senate and House bills.

TRADE EXPANSION ACT AMENDMENT: H. R. 9696 (Berry) introduced in House July 8, 1965, to amend the Trade Expansion Act of 1962; to Committee on Ways and Means. Rep. Berry in Congressional Record (pp. 15485-15486), July 8, 1965, pointed out that the legislation which he was joining in introducing would go far to moderate the extreme measures that could be taken under the present law. First, the hope of gaining adjustment assistance would be considerably enhanced by loosening the requirements of the law. Second, criteria are laid down by which items can be removed from the President's list of products offered for tariff cuts. The present bill would go beyond that by providing for import quotas if certain import levels are reached. Also, H. R. 9920 (Fisher) July 19; H. R. 10058 (Dent), July 26; to Committee on Ways and Means.

Rep. Moore in Congressional Record (pp. 15733-15735), July 9, 1965, stated that he was joining those who have introduced a bill to amend the Trade Expansion Act of 1962 so as to "remove certain items from the President's list and provide machinery for the imposition of import quotas to prevent imports from doing yet more damage than they have already inflicted on many of our industries."

Rep. Fisher in extension of remarks in Congressional Record (p. A3873-A3875), July 19, 1965, pointed out the urgent need for amending the Trade Expansion Act of 1962. Bill would establish criteria to guide our negotiators in Geneva, would make it possible to prevent further tariff reductions in all instances in which imports have reached a height equal to at least 7½ percent of domestic production, provided that the imports had increased at least 75 percent since 1958, which was the year in which the last preceding tariff-cutting act was passed.

H. R. 10135 (Fogarty), introduced in House July 28, 1965, to amend the Trade Expansion Act of 1962; to the Committee on Ways and Means. Would in effect establish a new style of peril point by providing that no product that is imported to the extent of at least 7½ percent of domestic production and has increased as much as 75 percent since 1958 would be subjected to another tariff cut under the present negotiations; or if imports already supply as much as 20 percent of the domestic market, while the number of production workers in the domestic industry has declined since 1958, no further tariff cut would be permitted. There are a few other criteria that, if met by imports of a particular product, would remove that item from the President's authorization to cut the tariff.

Rep. Langen pointed out in Congressional Record (pp. 18067-18068), July 29, 1965, under the title, "U.S. Economy Needs Improved Trade Policy," that he joined

others who have introduced legislation to amend the Trade Expansion Act, and gave his reasons. H. R. 10188 (Utt) introduced in House July 29, to amend the Trade Expansion Act of 1962; to Committee on Ways and Means.

H. R. 10237 (Mrs. Reid of Ill.) and H. R. 10285 (Hall) introduced in House Aug. 3, and Aug. 4, 1965, respectively, to amend the Trade Expansion Act of 1962; to Committee on Ways and Means. Rep. Collier in Congressional Record (p. 18569), Aug. 3, 1965, pointed out that a bill should be passed that provides that any product whose imports have risen 75 percent since 1958 and now occupies 7½ percent of domestic production, should be taken off the list of products to be considered for further tariff reductions.

VESSEL "JANICE VEE": Subcommittee on Coast Guard, Coast and Geodetic Survey, and Navigation of House Committee on Merchant Marine and Fisheries July 14, 1965, held hearing on H. R. 2137, to permit the vessel Janice Vee to be documented for use in the fisheries and coastwise trade.

WATER POLLUTION CONTROL ADMINISTRATION: Senate July 28, 1965, insisted on its amendments to S. 4, Water Quality Act of 1965, asked for conference with House, and appointed conferees.

House July 29, 1965, insisted on its amendment to S. 4; agreed to a conference asked by the Senate, and appointed conferees. Would amend the Federal Water Pollution Control Act as amended, to establish the Federal Water Pollution Control Administration, to provide grants for research and development, etc.

Conferees, Aug. 4, 1965, met to resolve the differences between the Senate- and House-passed versions of S. 4; recessed subject to call.

WATER PROJECT RECREATION ACT: Senate July 12, 1965, received message from the President announcing that on July 9, 1965, the President approved and signed S. 1229, to provide uniform policies with respect to recreation and fish and wildlife benefits and costs of Federal multiple-purpose water resource projects, and for other purposes (P. L. 89-72).

WATER RESOURCES PLANNING ACT: Committee of Conference July 8, 1965, filed conference report (H. Rept. 603) in House on S. 21, to provide for the optimum development of the Nation's natural resources through the coordinated planning of water-related land resources, establishment of a water resources council and river basin commission.

H. Rept. 603, Development of the Nation's Natural Resources (July 8, 1965, report from the Committee of Conference, U. S. House of Representatives, 89th Congress, 1st session, to accompany S. 21), 13 pp., printed. Committee recommended that Senate recede from its disagreement to the amendment of the House and agree to the same with an amendment. Discusses statement of policy and effect on existing laws; presents text of bill, and statement of managers on the part of the House.

By a voice vote House July 13, 1965, adopted the conference report on S. 21, and sent the bill to the Senate.

Senate July 14, 1965, received and agreed to report of the Committee of Conference on S. 21. Thus bill was cleared for President's signature.

President on July 22, 1965, signed S. 21 (P. L. 89-80).



RECENT FISHERY PUBLICATIONS

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THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20402. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SSR - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

- | Number | Title |
|----------|---|
| CFS-3756 | - Fish Meal and Oil, January 1965, 2 pp. |
| CFS-3791 | - Maine Landings, 1964 Annual Summary, 16 pp. |
| CFS-3795 | - Florida Landings, 1964 Annual Summary, 12 pp. |
| CFS-3798 | - North Carolina Landings, March 1965, 4 pp. |
| CFS-3802 | - Maine Landings, February 1965, 4 pp. |
| CFS-3804 | - Georgia Landings, 1964 Annual Summary, 9 pp. |
| CFS-3805 | - Fish Meal and Oil, February 1965, 2 pp. |
| CFS-3807 | - Rhode Island Landings, January 1965, 3 pp. |
| CFS-3811 | - Fish Meal and Oil, March 1965, 2 pp. |
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(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, April 1965, 15 pp., (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 S. Canal St., Rm. 704, Chicago, Ill. 60607.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the month indicated.

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Gulf Fisheries (Selected Areas) - 1964, by E. J. Barry, 40 pp., illus., June 1965. (Market News Service, U. S. Fish and Wildlife Service, 600 South St., New Orleans, La. 70130.) Summarizes the commercial landings of fish and shellfish for selected areas of the Gulf States of Florida (West Coast), Alabama, Mississippi, Louisiana, and Texas. The tables show landings for only the specific areas designated and cannot be interpreted as representing the total landings for a given state. However, the data do give an indication of general trends. Part I reports on developments and conditions in Gulf Coast fisheries during 1963 and gives a resume of the individual fisheries. Discusses the shrimp fishery in detail; production and market conditions for the oyster, blue crab, and finfish fisheries; as well as imports of fresh and frozen fish and shellfish. Part II includes statistical tables showing total fishery products landings; crab meat production by areas and months; and menhaden landings, and production of fish meal, oil, and solubles. It also gives data on fishery imports through Morgan City and the New Orleans, La., Customs District, Port Isabel-Brownsville and Houston, Tex., and Mobile, Ala.; and LCL express shipments from New Orleans for 1964 by months and destination. Also included are tables showing monthly range of wholesale prices of fishery products on the New Orleans French Market; Gulf States oyster and shrimp packs, 1963/64 season and packs by season 1959/64; and fishery products market classifications in the Gulf Area.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, May 1965, 13 pp., (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; Gulf menhaden landings and production of meal, oil, and solubles; fishery imports at Mobile, Ala., Morgan City and New Orleans, La., Miami, Fla., and Houston, Port Isabel, and Brownsville, Tex.; and sponge sales; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, May 1965, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New York City's Wholesale Fishery Trade, 1964 (Includes Statistics and Marketing Trends), 44 pp., illus., (Market News Service, U. S. Bureau of Commercial Fisheries, 155 John St., New York, N. Y. 10038.) The first part of this annual summary discusses fish-

ery products receipts, prices, and imports; fish meal, oil, and solubles prices; highlights of the 1964 season; shrimp supplies, prices, and imports; and canned tuna prices in the salt-water section of New York's wholesale Fulton Fish Market. The second section covers receipts, prices, and trends in the fresh-water fish market (Peck Slip Area). The final section contains statistical tables giving receipts of fresh and frozen fish and shellfish by species, states and provinces, and transport methods, 1963-64; landings and ex-vessel prices at Fulton Market; imports through New York Customs District; frozen fishery products prices by months; and monthly shrimp imports by country.

Southeastern Alaska Sea Surface Temperatures, 1959-63, by Richard S. Williamson, Data Report 8, 2 microfiche cards, illus., April 1965, distribution limited, (Branch of Reports, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington, D. C. 20240.)

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, May 1965, 9 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

THE FOLLOWING SERVICE PUBLICATION IS FOR SALE AND IS AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402.

Fish and Shellfish Over the Coals, Test Kitchen Series No. 14, 24 pp., illus., printed, 1965, 40 cents. Developed especially for those who enjoy cooking outdoors, this new booklet gives recipes for lobster tails, whitefish in foil, flounder with crab stuffing, rainbow trout, charcoal-broiled scallops, and many other tasty fishery delicacies. Home economists of the Bureau test-proved nearly 40 new recipes and serving ideas which are illustrated in color in the booklet. It also has helpful suggestions for buying fish for quality and quantity, and tips on starting and maintaining the charcoal fire. This new publication is part of the continuing consumer education program being conducted in cooperation with the fishery industries of the United States. It should help many more consumers realize the economy and nutritive value of fish as an every day food.

MISCELLANEOUS PUBLICATIONS

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The Air Almanac, 1965, September-December, Catalog No. D 213.7:965/3, 328 pp., illus., processed, June 1965, \$3.25. Naval Observatory, U. S. Department of the Navy, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) This issue of the almanac provides, in convenient form, the astronomical data required for air navigation during the period Sept. 1, 1965 to Jan. 1, 1966.

ANAESTHETICS FOR FISH:

A Guide to the Properties, Characteristics and Uses of Some General Anaesthetics for Fish, by Gordon R. Bell, Bulletin No. 148, 13 pp., printed, 1964, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada. Agents, described as general anaesthetics, which reversibly depress the sensory centers of the brain to various degrees and which finally eliminate reflex action, are being used more and more widely in fisheries biology. The author has prepared a chart which assembles the essential data on anaesthetics for fish to act as a guide for selection of the most appropriate anaesthetic for laboratory or field work. Eleven chemical anaesthetics are detailed. Information on each includes: manufacturer, expense, molecular weight, solubility, stability, toxicity to man, dosage required, immobilization and "righting" time periods, peculiar effects, suggested uses, and particular reaction involved. Topical and general bibliographies are included.

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Code of Federal Regulations, Title 50--Wildlife and Fisheries (Revised as of January 1, 1965), 166 pp., printed, 1965, 60 cents. Office of the Federal Register, National Archives and Records Service, General Services Administration, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

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Instructional-educational picture-stories of numerous aspects of human knowledge are available as color slide sets and film strips. Each set of slides is packaged in a durable cardboard container, labeled for ease of identification. Each slide is identified by title and code number, making it easy to select and project specific slides correlated to the day's lesson. Each filmstrip, using color photographs, is typically designed for use in whole or in part. Text frames itemize concepts, vocabulary frames point out new words, simplified diagrams and discussion questions help clarify ideas. Several are on the sea, lakes, and streams. Society of Visual Education, Inc., 1345 Diversey Parkway, Chicago, Ill. 60614:

Algae and Fungi, S53S, Natural Science series, for Jr.-Sr. High Schools, set of 10 slides, \$4.50.

Introduction to Algae, 448-2, The Microscope and Its Use series, for Jr.-Sr. High Schools, 35 captioned frames, \$5. How a specimen is prepared for investigation and how the nucleus of the algae cell is made visible under the microscope.

Let's Explore a Pond, 423-4, Exploring the World of Nature series, for Intermediate-Jr. High Schools, 50 captioned frames, \$6. Shows how ponds are formed, how they may fill to form marshes and swamps. Illustrates plant and animal life and their growth and activity in summer and winter.

Let's Explore a Stream, 423-5, Exploring the World of Nature series, for Intermediate-Jr. High Schools, 50 captioned frames, \$6. Illustrates plants and animals in various habitats formed by pools, riffles, and waterfalls; how moving water works for man; and how thoughtless pollution of streams destroys plant and animal life.

Songs of the Sea, 681-1R, Our American Heritage of Folk Music Series, for Intermediate-Jr.-Sr. High Schools, 46 frames with 33 1/2 r. p. m. record (coupled with Songs of the Cowboy), both filmstrips with record \$15. How singing eased the labor and loneliness of seafaring men in the days of sail--"Haul Away, Joe"; "Blow the Man Down"; "Rio Grande"; and "Shenandoah."

Water Conservation Today, 433-3, Conservation for Today's America series, for Intermediate-Jr. High Schools, 39 frames with Teacher's Guide, \$6. Study of remedies for water problems--protection of watersheds, efficient use of water, prevention of water pollution.

Work of the Sea, 443-4, Our Ever Changing Earth series, for Intermediate-Jr. High Schools, 45 captioned frames, \$6. Some types of coasts, waves and currents, shore features caused by erosion and deposition. Illustrates terms such as stacks, bars, spits, fiords, and lagoons.

FISHERY EDUCATION:

"Goda erfarenheter från den Svensk-Tunisiska fiskarskolan" (Good experiences from the Swedish-Tunisian fishery school), by Georg Aberg, article, *Svenska Vastkustfiskaren*, vol. 35, no. 8, April 25, 1965, pp. 124-126, illus., printed in Swedish. Svenska Vastkustfiskarnas Centralforbund, Ekonomiutskottet Post-box 1014, Goteborg 4, Sweden.

FISHERY MANAGEMENT:

"Federal conference on theoretical problems of fishery management," article, *Rybnoe Khoziaistvo*, vol. 40, no. 6, 1964, pp. 89-90, printed in Russian. Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, Moscow B-140, U. S. S. R.

FISH FARMING:

Solution of Some Technical Problems in Fish Farming: Manual of Methods, by D. A. Kulik, 23 pp., printed in Russian, 1964. Knizhnoe Izdatel'stvo, Kaliningrad, U. S. S. R.

FISH FEEDING:

"New feeds for fishery management," by V. G. Sil'yanov and Yu. M. Makhotin, article, *Rybnoe Khoziaistvo*, vol. 40, no. 6, 1964, p. 19, printed in Russian. Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, Moscow B-140, U. S. S. R.

FISHING LIMITS:

"La convention de Londres de 1964 sur les pêches et les droits acquis dans la zone des 6 à 12 milles: De la théorie à la mise en oeuvre" (The 1964 London Convention on Fisheries and the rights acquired in the 6-12-mile zone: From theory to achievement), by A. Boyer, article, *La Pêche Maritime*, vol. 44, no. 1046, May 1965, pp. 311-312, printed in French, single copy 14 francs (US\$2.85). La Pêche Maritime, 190, Blvd. Haussmann, Paris 8^e, France.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

FISHING METHODS:

"Research on improvement of fishing methods," by W. R. Martin, article, Federal-Provincial Conference on Fisheries Development, January 20-24, 1964, Canadian Fisheries Report No. 3, printed, 1964, Department of Fisheries, Ottawa, Canada.

FISHING WITH LIGHTS:

Catching Fish by Light; Theory and Practice, by I. V. Nikonov, 186 pp., printed in Russian, 1963, Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, Moscow B-140, U.S.S.R.

FISH-LIVER OIL:

"Analysis of fatty acids and triglycerides of codliver oil," by H. P. Kaufmann and T. H. Khoe, article, Fette, Seifen, Anstrichmittel, vol. 66, 1964, p. 590, printed in German, Industrieverlag von Herhausen K. G., 24 Rodingsmarkt, Hamburg II, Germany.

"A study of the hypocholesterolemic activity of the ethyl esters of the polyunsaturated fatty acids of cod liver oil in the rat," by S. G. Kahn, article, Journal of Nutrition, vol. 83, 1964, p. 262, printed, American Institute of Nutrition, 36th Street at Spruce, Philadelphia 4, Pa.

FISH MEAL:

"Amino acids in the principal fishmeals," by A. DeVuyt and others, article, Agricultura, vol. 12, 1964, p. 153, printed in Spanish. Secretaría de Estado de Agricultura, Pecuaria y Colonizacion, Santo Domingo, Dominican Republic.

"Different methods for preparing a feed meal from fresh and acid-preserved fish scraps," by L. N. Egorova and M. N. Ereneeve, article, Chemical Abstracts, vol. 59, Nov. 11, 1963, Abstract No. 12094e, printed, American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

"The effect of heat on the amino acid, fatty acid and B-vitamin composition of fish meal," by V. C. Mason and K. Weidner, article, Acta Agriculturae Scandinavica, vol. 14, 1964, p. 87, printed in English, French, and German, single copy 20 Kroner. Scandinavian Agricultural Research Workers' Association, Royal Swedish Academy of Agriculture, Postoffice Hovslagargatan 2III, Stockholm C., Sweden.

"Fishmeal, bloodmeal and meat-and-bone meal in animal nutrition," by H. Bergner, article, Deutsche Landwirtschaft, vol. 14, 1963, p. 551, printed in German, Deutscher Bauernverlag, Reinhardtstr. 14, Berlin NW7, Germany.

Articles from Annales de Zootechnie, printed in French, Institut Nationale de la Recherche Agronomique, 149 Rue de Gronelle, Paris (7^e) France:

"An investigation of the nitrogen requirements of the growing pig. I--The utilisation of fish meal at three different levels," by A. Rerat and Y. Henry, vol. 13, 1964, p. 5.

"Measurement of the absorption of oxygen by fish meals. Application to their stabilization by means of antioxidants," by J. Flanzy and others, vol. 11, 1962, p. 263.

"Investigations of the use of deodorized fish meal in chick feeds," by E. Nowack, article, Die Bodenkultur, vol. 14, 1963, p. 179, printed in German, Verlag Georg Fromme & Co., Nikolsdorfergasse 11, Vienna 5, Austria.

"Protein quality of feeding-stuffs. 3--Comparative assessment of the protein quality of three fish meals given to growing pigs," by R. S. Barber and others, article, British Journal of Nutrition, vol. 18, 1964, p. 545, printed, Cambridge University Press, 32 E. 57th St., New York, N. Y. 10022.

"Större satsning på fiskmjölsproduktion" (Greater proportion of fish landings for meal production), article, Svenska Vastkustfiskaren, vol. 35, no. 9, May 10, 1965, pp. 146-147, printed in Swedish. Svenska Vastkustfiskarnas Centralforbund, Ekonomiskt Kottet Postbox 1014, Goteborg 4, Sweden.

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"Rancidity in lean fish muscle. I--A proposed accelerated copper-catalyzed method for evaluating the tendency of fish muscle to become rancid; II--Anatomical and seasonal variations," by C. H. Castell and Jill MacLean, articles, Journal of the Fisheries Research Board of Canada, vol. 21, no. 6, 1964, pp. 1345-1359, 1361-1369, illus., printed, single copy C\$2.00, Queen's Printer and Controller of Stationery, Ottawa, Canada.

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Articles from Journal of the American Oil Chemists' Society, vol. 41, 1964, American Oil Chemists' Society, 35 E. Wacker Dr., Chicago 1, Ill.

"Fatty acid composition of oils from 21 species of marine fish, freshwater fish and shellfish," by E. H. Gruger, Jr., R. W. Nelson, and M. E. Stansby, pp. 662-667.

"Synthesis of triglycerides from fish oil fatty acids," by L. W. Lehman and E. J. Gauglitz, Jr., p. 533.

FISH POPULATIONS:

"Population management," by G. F. M. Smith and A. L. Pritchard, article, Federal-Provincial Conference on Fisheries Development, January 20-24, 1964, Canadian Fisheries Report No. 3, pp. 39-42, printed, 1964. Department of Fisheries, Ottawa, Canada.

FISH PROTEIN CONCENTRATE:

"Adaptation of the Carpenter method for the amount of assimilable lysine in fish flour," by J. Janicki and J. Skupin, article, Journal of the American Oil Chemists' Society, vol. 41, 1964, p. 46, printed, American

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Oil Chemists' Society, 35 E. Wacker Dr., Chicago, Ill. 60601.

"Characteristics and nutritional value of various fish protein concentrates," by H. E. Power, article, Journal of the Fisheries Research Board of Canada, vol. 21, no. 6, 1964, pp. 1489-1504, illus., printed, single copy C\$2. Queen's Printer and Controller of Stationery, Ottawa, Canada.

"Fish flour supplementing effect on low-protein and high-protein maize diets of India," by V. Chalam Metta and Saroja Metta, article, Indian Journal of Medical Research, vol. 52, no. 4, 1964, pp. 392-397, printed. Job Press Private Ltd., P. O. Box 124, Cawnpore, India.

"A note on the relative nutritive value and the total and 'available' methionine, tryptophan and histidine in some fish flours," by H. N. De, article, Pakistan Journal of Scientific and Industrial Research, vol. 6, 1963, p. 299, printed. Pakistan Council of Scientific and Industrial Research 3/4/D/VI, Nazimabad, Karachi, Pakistan.

"The nutritive quality and available amino acid composition of some animal protein concentrates," by D. G. Waterworth, article, British Journal of Nutrition, vol. 18, 1964, p. 503, printed. Cambridge University Press, 32 E. 57th St., New York, N. Y. 10022.

Reprints from Anales de Bromatologia, vol. 16, 1964, in Spanish with English summaries. Sociedad Espanola de Bromatologia, Ciudad Universitaria (Edificio Facultad de Farmacia), Madrid, Spain:

Sobre el Valor Biologico y Otros Indices Nutritivos de las Proteinas de MUSTELUS MUSTELUS y RAJA CLAVATA (On the Biological Value and Other Nutritive Indices of the proteins of *Mustelus mustelus* and *Raja clavata*), by J. Bello, J. Larralde and C. Rodriguez, pp. 475-483, illus. Results on studies of digestibility of two types of fish protein concentrate.

Sobre el Valor Biologico y Otros Indices Nutritivos de las Proteinas de SARDINA PILCHARDUS, TRACHURUS TRACHURUS, BRAMA RAI y MERLUCCIOUS MERLUCCIOUS, (On the Biological Value and Other Nutritive Indices of the Proteins of *Sardina pilchardus*, *Trachurus trachurus*, *Brama rai* and *Merluccius merluccius*), by J. Larralde, J. Bello and C. Rodriguez, pp. 307-321, illus. Results of studies of digestibility of four types of fish flour or fish protein concentrate.

Articles from International Association of Fish Meal Manufacturers News Summary, no. 16, Jan. 1965, processed. International Association of Fish Meal Manufacturers, 70 Wigmore St., London W1, England.

"War on malnutrition," pp. 6-18, illus. (Reprinted from Pesca, Sept. 1964, pp. 14-21.) Reports on the value of fish flour as a major, inexpensive protein supplier. Discusses the challenge to fish industrialists to investigate and develop fish protein concentrate as a primary weapon in the war against malnutrition, particularly in underdeveloped nations.

"Fish flour in Peru," by Steve Harrison, pp. 18-21, (Reprinted from Andean Air Mail and Peruvian Times, Nov. 13 1964.) A report on the verification, especially in Peru, of fish flour as an edible commodity. The news item is designed to throw light on a subject with which, in spite of its vital importance, the general public is inadequately informed.

"Edible fish flour (F. P. C.) now produced by pilot plants of two companies in Peru," pp. 22-24, processed in English with resumes in French, German and Spanish. (Reprinted from Peruvian Times, Nov. 27, 1964.) Discusses fish flour as a possible answer to Peru's great need to increase per capita protein consumption.

FISH SOUNDS:

"The not-so-silent sea," by Frank T. Dietz, article, Maritimes, vol. 9, no. 2, spring 1965, pp. 10-12, illus., printed. Graduate School of Oceanography, University of Rhode Island, Kingston, R. I. 02881.

FISHWAYS:

"Pitlike fish ladder," by V. P. Kulikov, article, Rybnoe Khoziaistvo, vol. 40, no. 6, 1964, pp. 85-86, printed in Russian. Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, Moscow B-140, U.S.S.R.

FLORIDA:

(Florida Board of Conservation) Second Biennial Report, 1963-1964, 105 pp., illus., printed, March 1, 1965. Division of Administration, Florida Board of Conservation, W. V. Knott Bldg., Tallahassee, Fla. Summarizes activities of the Board of Conservation's divisions of Administration, Salt Water Fisheries, Water Resources and Conservation, Waterways Development, Geology, and Beaches and Shores during calendar years 1963 and 1964. Commercial fishing is one of the State's great industries, with an annual gross income of more than \$100 million, involving 150,000 people engaged in taking, processing, transporting and marketing fishery products. Division of Salt Water Fisheries accomplishments included law enforcement work and research--red tide studies, oyster rehabilitation and depuration, fish tagging, report on accidental introduction of piranha into Florida waters, and other exploratory and biological activities. Marketing and production assistance and promotion of fishery products were highly emphasized during the biennium. The Legislature provided for the use of profits from oystershell sales, previously earmarked for biological research only, in the financing of a market promotion program for the seafood industry. Included in the report are statistical data on commercial fishing licenses issued, oyster leases granted, and spiny lobster and stone crab landings. Some other activities of the Board were dumping of auto bodies offshore to form artificial reefs, dredging and maintenance of waterways, and conservation of fresh-water resources. The newly-created Division of Beaches and Shores enforced provisions of the law relating to preservation, conservation, and restoration of beaches and shore, including control of beach erosion and protection against hurricane and storm damage.

Summary of Florida Commercial Marine Landings, 1963, 23 pp., processed, Nov. 1964. Board of Conservation, Salt Water Fisheries Division, Marine Fisheries Research, Tallahassee, Florida.

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FOOD AND AGRICULTURE ORGANIZATION:

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Program for Technical Assistance for developing the fisheries of many countries. These reports have been processed only for limited distribution to governments, libraries, and universities. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy:

Informe al Gobierno de Nicaragua sobre Mejoramiento de las Tecnicas de Pesca en el Lago de Managua y Otras Aguas Continentales, 1961-62 (Report to the Government of Nicaragua on Improving Fishing Techniques in Lake Managua and Other Inland Waters, 1961-62), by Dietmar R. Riedel, EPTA Report No. 1885, 59 pp., illus., in Spanish, June 1964.

Rapport au Gouvernement du Mali sur l'Amelioration de l'Industrie du Traitement du Poisson (Report to the Government of Mali on Improving the Fish Processing Industry), by Moustafa Aref, EPTA Report No. 1914, 57 pp., illus., in French, July 1964.

Proceedings of the World Scientific Meeting on the Biology of Tunas and Related Species, FAO Fisheries Reports No. 6, vol. 4, 427 pp., processed in French, Spanish, and English, 1964. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

FRANCE:

"Exportations" (Exports), article, *France Pêche*, no. 94, April 1965, pp. 28-30, printed in French. *France Pêche*, Boite Postale 179, Lorient, France, single copy 2.5 F. (about US\$0.50). Consists of tables comparing quantities and values of fishery products exported in 1963 and 1964.

The following articles are from *La Pêche Maritime*, vol. 44, no. 1045, April 1965, printed in French, single copy 14 francs (US\$2.85). *La Pêche Maritime*, 190, Blvd. Haussmann, Paris 8^e, France:

"Une conference de M. Jacques Huret sur l'adaptation de l'industrie de la pêche à l'évolution économique et sociale des grandes villes" (A commentary from M. Jacques Huret on the adaptation of the fishing industry to the social and economic evolution of large cities), pp. 236-238, illus.

"1965 sera une année difficile mais 1966 doit marquer le début d'une période nouvelle" (1965 will be a difficult year, but 1966 could mark the beginning of a new era), by Jean Morin, pp. 232-235.

"1964 aurait dû être une année test; ce fut, une nouvelle fois, une période d'attente" (1964 was supposed to have been a test year; it was again, however, a period of waiting), by M. Parquic, pp. 226-231.

FREEZE-DRYING:

"Custom freeze-drying services means to increased profits," by W. L. Porter and W. L. Root, article, *Canner Packer*, vol. 133, no. 29, June 1964, p. 32, printed, single copy 50 cents. Vance Publishing Co., 59 E. Monroe St., Chicago, Ill. 60603.

"Freeze vacuum drying of marine products. III--Test on salmon meat," by Kiichiro Kobayashi and Shuzo Igarashi, article, *Bulletin of the Faculty of Fisheries, Hokkaido University*, vol. 14, no. 4, 1964, pp. 209-214, printed. Faculty of Fisheries, Hokkaido University, Kameda-Machi, Hakodate, Japan.

"Present state and trends in the development of the freeze-drying of foodstuffs," by J. Strasser, article, *Fette Seifen Anstrichmittel*, vol. 65, no. 10, Oct. 1963, pp. 846-850, printed in German. Industrieverlag von Herhausen K. G., 24 Rodingsmarkt, Hamburg II, Germany.

FREEZERSHIP:

Freezing Vessels, edited by A. M. Kam and A. F. Yundtseva, 524 pp., printed in Russian, 1963. Sudprom-giz, Leningrad, U.S.S.R.

FREEZING:

"Minimizing freezing damage and thawing drip in fish fillets," by John H. Mahon and Charles G. Schneider, article, *Food Technology*, vol. 18, Dec. 1964, pp. 117-118, printed, single copy \$1.50. The Garrard Press, 510 No. Hickory St., Champaign, Ill. 61823.

"Some problems in the nitrogen freezing of fish," by G. Lorentzen, article, *Bulletin of the International Institute of Refrigeration, Annex 1964-1*, pp. 39-46, illus., printed. International Institute of Refrigeration, 177 Blvd. Malesherbes, Paris 17, France.

FRESH-WATER FISH:

Familiar Freshwater Fishes of America, by Howard T. Walden II, 336 pp., illus., printed, 1964. Harper and Row, Publishers, 49 E. 33rd St., New York, N. Y. 10016.

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"Possibilities of raising frogs on commercial scale," article, *Australian Fisheries Newsletter*, vol. 24, no. 5, May 1965, pp. 23-25, illus., printed. Fisheries Branch, Department of Primary Industry, Canberra, A. C. T., Australia.

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Effect of Polyphosphates and Other Salts on Drip Loss and Oxidative Rancidity of Frozen Fish, by J. W. Boyd and B. A. Southcott, 15 pp., printed. (Reprinted from the *Journal of the Fisheries Research Board of Canada*, vol. 22, no. 1, 1965, pp. 53-67.) Queen's Printer and Controller of Stationery, Ottawa, Canada.

GEAR:

Control and Measuring Gear on Board Vessels, by P. I. Bendik and A. M. Lapides, 272 pp., printed in Russian, 1964. Voenizdat, Moscow, U.S.S.R.

Articles from *Rybnoe Khoziaistvo*, vol. 40, 1964, printed in Russian. *Rybnoe Khoziaistvo*, V. Krasnosel'skaia 17, Moscow B-140, U.S.S.R.:

"Exhibition of equipment used by fish enterprises," by V. Solov'eva, no. 6, pp. 90-91.

"Exploitation of warps in the Murmansk trawler fleet," by A. M. Konyaev, no. 7, pp. 34-35.

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HAKE:

"Nuevos métodos de industrialización de merluza en Chile, II--Conserva de productos ahumados" (New methods of processing hake in Chile, II--Canned dried products), by Enrique Torrejón, article, *Informacion Conservera*, vol. 13, no. 134, Feb. 1965, pp. 52, 53-56, illus., printed in Spanish, single copy 30 ptas. (about US\$0.50), Informacion Conservera, Colón, 62, Valencia, Spain.

HERRING:

Contributions, Herring Symposium, Copenhagen, 1961, edited by B. B. Parrish, 293 pp., printed, 1963. Proceedings of the International Council for the Exploration of the Sea, Charlottenlund-Slot, Charlottenlund, Denmark.

Estimation of the State of Resources of the Atlantic-Scandinavian Herring, by Yu. Yu. Marti, S. S. Federov and I. G. Yudanov, Translation No. 51, 7 pp., illus., printed, 1964. (Translated from the Russian, *Soviet Fisheries Investigations in North European Seas*, 1960, pp. 399-404.) Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England.

"Síldarleit og síldargöngur 1964" (Exploratory herring cruises and occurrence of herring schools, 1964), by Jakob Jakobsson, article, *Aegir*, vol. 58, no. 4, March 1, 1965, pp. 83-90, illus., printed in Icelandic. Aegir, Fiskifélags Íslands, Reykjavik, Iceland.

Articles from *Rybnoe Khoziaistvo*, vol. 40, no. 6, 1964, printed in Russian. *Rybnoe Khoziaistvo*, V. Krasnosel'skaia 17, Moscow B-140, U.S.S.R.:

"Centrifugal method of isolation of fat from the flesh of salted herring," by A. A. Lyubavina, p. 75.

"Mechanized herring line on the floating factory *Skala*," by K. I. Karpov, pp. 65-68.

"Search for herring with commercial vessels operating in the Atlantic," by S. Edemskii, p. 44.

ICELAND:

"Icelandic fishing vessels. Part Two," by Hjalmar R. Bardarson, article, *Iceland Review*, vol. 3, no. 1, 1965, pp. 19, 21, 23-24, illus., printed, single copy 50 Kr. (about US\$1.15), *Iceland Review*, P.O.B. 1238, Reykjavik, Iceland. Covers in detail the 4 types of Icelandic vessels in the fisheries--open motor boats, decked steam and motor vessels under 100 gross registered tons (short), decked vessels over 100 GRT, and deep-sea trawlers. All vessels of 150-350 GRT are built of steel and are equipped for both long-lining and purse-seining for herring and cod, with a power-block. Safety features required by the Icelandic Directorate of Shipping include vessel stability provisions, particularly for purse-seiners; water-tight closing of a full-strength poop on the after main deck; and a complete set of stability calculations for each newly constructed vessel. Steering efficiency, providing for maneuvering the vessel in a tight circle when shooting the net, is increased in purse-seiners by the use of large rudder areas, and experimentally by an active-rudder and a bow-thruster. Trawlers are not used as frequently as

formerly since their catches have been poor in the past few years. Fishing vessels are in a continual state of development; the trend is to further mechanize fishing and to make it safer by the use of better equipped vessels, concludes the author.

ILLINOIS:

A Biological Investigation of the Fishes of Lake Chatauqua, Illinois, by William C. Starrett and Arnold W. Fritz, *Illinois Natural History Survey Bulletin*, vol. 29, art. 1, 108 pp., illus., printed, March 1965, Illinois Natural History Survey, Natural Resources Bldg., Urbana, Ill.

1963 Farm Pond Survey, by Ora M. Price, Special Fisheries Report No. 5, 20 pp., processed, October 1964, Illinois Department of Conservation, Division of Fisheries, Springfield, Ill.

INDUSTRIAL FISHERY PRODUCTS:

"A cheese-like product from fish," by M. A. Krishnaswamy and others, article, *Journal of Food Science and Technology, India*, vol. 1, no. 1, 1964, p. 1, printed, Association of Food Technologists, Central Food Technological Research Institute, Mysore 2, India.

International Association of Fish Meal Manufacturers News Summary, no. 16, Jan. 1965, 162 pp., illus., processed, distribution restricted, International Association of Fish Meal Manufacturers, 70 Wigmore St., London W1, England. Contains among others, the following articles: "Studies on the incidence of salmonella germs in imported fish meal," by J. Jacobs and others; "Preparation of refined fish flour," by G. M. Dreosti and Alison Atkinson; "The amino acids of the most important fish meals," by A. de Vuyst and others; "Relationship between protein quality in fish meals, as shown by the 'available lysine' figure, and the condition of the fat, as shown by the free fatty acid content and peroxide value," by Harry Pritchard; "Extracted herring meal as sole protein supplement," by Willy Hansen; and "Studies on sardine oil."

INSULIN:

"Isolation of insulin from the fish, *Lophius piscatorius* by gel filtration," by Rene E. Humbel, article, *Chemical Abstracts*, vol. 59, Oct. 28, 1963, Abstract No. 10415, printed, American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

INTERNATIONAL AGREEMENTS:

Fisheries, King Crab, Agreement between United States and Union of Soviet Socialist Republics, Signed Washington, Feb. 5, 1965 (Entered into Force Feb. 5, 1965), Treaties and Other International Acts Series, No. 5752, 11 pp., printed in Russian and English, 1965, 10 cents. Department of State, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

IRRADIATION PRESERVATION:

Current Status & Commercial Prospects for Radiation Preservation of Food, TID 21431, 183 pp., illus., printed, Jan. 1965, 55 cents. Business & Defense Services Administration, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The preservation of food by ionizing radiation is fast approaching com-

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mercialization, and within the decade irradiation will be recognized as a major preservation technique, concludes this report prepared for the Atomic Energy Commission. Of the 28 products covered in the study in connection with 6 irradiation processes, 17 (including marine products) were found to have either good or excellent prospects for domestic or international markets. The study also indicates the direction and magnitude of changes or problems which may affect other food processing industries as adoption of the radiation technique increases. It includes an analysis and discussion of international aspects, Government regulations, consumer reaction, and other factors involved in the development of the irradiation preservation industry. It states that Major benefits of this new method will be felt in areas not reached by other processes. Irradiation preservation is expected to replace some present methods of preservation and to be used in combination with other processes. The benefits anticipated include elimination of food-borne hazards to health; availability of new and more convenient foods; improvement in food quality; savings from reductions in spoilage; and market expansion as the result of extensions of shelf life and shipping distances. The value of all the efforts and expenditures by Government during the past decade will depend on development of commercial production capacities by private firms in the next decade, states the report. This is the first of a series which will include analyses of the economics and logistics of feeding irradiated foods to soldiers.

The Determination of the Wholesomeness of Irradiation-Pasteurized Clams. Final Summary, June 1963-August 1964, by E. F. Reber, TID 21226, 77 pp., printed, 1964. Technical Information Division, U. S. Atomic Energy Commission, Washington, D. C. 20545.

"Irradiated foods laws: meeting in Rome, April 21-28, 1964," article, Nuclear Engineering, vol. 9, 1964, pp. 97, 217, printed, Temple Press Ltd., Bowling Green Lane, London EC1, England.

Irradiation des Aliments (Food Irradiation), vol. 5, no. 3, Jan.-March 1965, 25 pp., illus., processed, Centre European d'Information pour l'Irradiation des Aliments, B. P. No. 6, Gif-sur-Yvette (S.-et-O.), France. (For sale by the O.E.C.D. Mission, Suite 1223, 1346 Connecticut Ave. NW., Washington, D. C. 20006.) Some of the articles are: "Data on wholesomeness studies--a progress report," by Nicholas Raica Jr.; "Studies on food irradiation in Japan"; and "Irradiation extends storage life of Bombay duck (*Harporodon nehereus*)."

Reports prepared by Division of Technical Information Extension, U. S. Atomic Energy Commission, Oak Ridge, Tenn. (For sale by the Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Port Royal and Braddock Rds., Springfield, Va. 22151.):

Effect of Irradiation on the Microbial Flora Surviving Irradiation Pasteurization of Seafoods--Final Summary, May 1963-April 1964, by R. O. Sinnhuber and J. S. Lee, SAN-100-1, 63 pp., illus., processed, Nov. 1964, \$3. This annual report contains results of research conducted by the Department of Food Science

and Technology, Oregon State University. Objectives of the studies are to: (1) examine the shift in the natural microbial flora (including yeasts and molds) due to the variation in irradiation resistance and to determine (a) the spoilage of those organisms, (b) their pathogenicity; (2) determine whether any of the organisms which survive are mutants, and their role, if any, in spoilage; and (3) investigate the complimentary effects of approved food additives such as nitrates and other radiolethal agents. Dover sole (*Microstomus pacificus*) fillets were chosen as the first fishery product to be investigated. The storage life for a given radiation dose, states the report, depends on the initial number and types of organisms. Therefore, the radiation pasteurization can be more successful when the microbiological quality of the fresh fish samples is controlled. The shelf life of irradiated Dover sole can be further extended by the use of 0.1 percent sodium benzoate as an additive.

Radiation Pasteurization of Foods--Summaries of Accomplishment, Presented at Fourth Annual Contractors' Meeting, October 21-22, 1964, Conf-641002, 207 pp., processed, 1965, \$6. Some of the articles are: "Simultaneous radiation heating treatment of haddock," by J. T. R. Nickerson; "Study of radiation pasteurized products," by L. J. Ronsivalli; "Radiation pasteurization of Pacific crab and flounder," by D. Miyasuchi; "Effects of ionizing radiation on lipids of fish," by M. E. Standsby; "Radiation pasteurization of Gulf shrimp and oysters," by Arthur F. Novak; "Irradiation preservation of fresh water fish," by H. L. Seagran; "The effect of radiation on the microbial flora surviving irradiation pasteurization of seafoods," by R. O. Sinnhuber; "Extractive studies on packaging materials to be used with irradiated foods," by E. A. Garlock; "Current status and prospects for the commercialization of radiation preservation of food," by J. M. Schaffer; and "The determination of the wholesomeness of irradiation pasteurized clams," by E. F. Reber. Also includes articles on: "The effects of gamma rays on haddock and clams inoculated with *Clostridium botulinum*, Type E," by J. T. R. Nickerson; "A study of the effect of ionizing radiation on resistance, germination and toxin synthesis of *Clostridium botulinum* spores, Types A, B and E," by J. T. Graikoski; "Growth characteristics of Type E, *Clostridium botulinum* in the temperature range of 34° to 50° F.," by W. P. Segnor; "The significance of *Clostridium botulinum* Type E in the application of radiation-pasteurization to Pacific crab meat and flounder," by M. W. Eklund; "Examination of Gamma irradiated Gulf shrimp for *Clostridium botulinum* and Type E toxin," by R. M. Grodner; "Basic microbiological and biochemical factors in radiation pasteurization of marine products," by A. M. Dollar; and "Basic radiation research," by L. J. Ronsivalli.

Articles from Nucleonics Week, vol. 5, no. 35, 1964, McGraw-Hill Book Co., 330 W. 42nd St., New York, N. Y. 10036:

"F. D. A. has approved 9 packaging materials for irradiated foods," p. 4.

"The marine products development irradiator will be dedicated," p. 4.

Abstracts from Nuclear Science Abstracts, vol. 18, 1964, U. S. Atomic Energy Commission, Washington,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402):

"Codfish and sweet potato--Report of observations on nutrition: radiation and sterilization of foods for Auburn University, Auburn, Alabama," by M. A. Ross, Abstract No. 11640.

"Corn and tuna diet--Report of observations on nutrition: radiation and sterilization of foods for Hazelton Laboratories, Falls Church, Virginia," by M. A. Ross, Abstract No. 11641.

ITALY:

Market Factors in Italy, by Fernande Lavallee, OBR 65-23, 12 pp., printed, April 1965, 15 cents, Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

JAPAN:

Fisheries Statistics of Japan, 1963, 65 pp., illus., processed, March 1965, Statistics and Survey Division, Ministry of Agriculture and Forestry, 1,2 chome, Kasumigaseki, Chiyoda-ward, Tokyo, Japan. Contains Japanese production statistics by type of fishery and species, 1963. Also data on fisheries enterprises, vessels, processing, and foreign trade. Types of fisheries include marine--trawling, salmon on drift-net, king crab gill-net, tuna long-line, skip-jack pole-and-line, purse seine, Pacific saury dip-net, and set-net; aquaculture--pearl, oyster, seaweed; and whaling. The Annual Report of Catch Statistics on Fishery and Aquaculture, issued yearly until 1963, will be published henceforth in 2 separate volumes; one written in Japanese for domestic users and this report in English for foreign users.

Bulletin of the Japanese Society of Scientific Fisheries, vol. 31, 1965, printed in Japanese with English abstracts. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba Kaigandori 6, Minato-ku, Tokyo, Japan.

_____, no. 1, Jan., 107 pp., illus. Contains, among others, articles on: "Studies on the resources of the jack mackerel, *Trachurus japonicus* (Temminck et Schlegel), in the East China Sea. II--Fishing efficiency of purse seiner of one-boat and two-boat operation types," by F. Mitani and E. Ida; "Studies on flavor of 'katsubushi,'" I--On the acidic, basic and phenolic components, II--Relations between flavors of 'smoke' and of 'katsubushi,'" by K. Nishibori; "Studies on fish-solubles, II--Nutritive value of commercial fish-solubles in rats and mice," by T. Onishi, S. Murayama, and T. Kaneda; "Studies on the biological formation of formaldehyde and dimethylamine in fish and shellfish. V--On the enzymatic formation in the pyloric caeca of Alaska pollock," by K. Yamada and K. Amano (in English); and "Bacterial permeability of tin-sealed sausage casing," by M. Nakaide and others.

_____, no. 2, Feb., 81 pp., illus. Some of the articles are: "Age composition of Atlantic tunas related with distribution of water temperature and distance from land. I--Yellowfin tuna; II--Albacore," by J. Nakagome and others; "Studies on the

small coastal gill-net fisheries and their resources. VI--Characteristics of the catch and fishing ground on the stopping-net (egiri-ami) fishery. VII--Ecological study of the fish population caught by the stopping-net (egiri-ami)," by T. Shiokawa; "Studies on the new nitrofurans derivatives as food preservatives. I--On the preservative effect of AF-2 and AF-5, II--A study on the chemical assay of nitrofurazone (F) and AF-2," by A. Obatake and others; "Studies on the effects of marine products on cholesterol metabolism in rats. IV--Fractionation of effective substances from purple laver (1)," by T. Kaneda and K. Arai; and "Studies on 'green' tuna. I--The significance of trimethylamine oxide," by C. Koizumi and Y. Hashimoto (in English).

_____, no. 3, March, 94 pp., illus. A few of the articles are: "Experimental use of fish pumps. VI--An attempt in using fish pump as pond cleaner," by H. Soeda and others; "On the anatomy and function of stomach of Japanese pearl oyster, *Pinctada martensii* (Dunker)," by Y. Kuwatani (in English); "Studies on the source of shellfish poison in Lake Hamana. I--Relation of the abundance of a species of dinoflagellate, *Prorocentrum* sp. to shellfish toxicity. II--Shellfish toxicity during the 'red-tide,'" by M. Nakazima (in English); and "Studies on new nitrofurans derivatives as food preservatives. III--Bioassay for AF-2 in foods. IV--On the behavior of AF-2 and nitrofurazone in fish sausage processing," by A. Obatake and T. Matsuda.

KING CRAB:

Movements of Tagged Crabs *PARALITHODES CAMTSCHATICA* (Tilesius) in the Kodiak Island-Lower Cook Inlet Region of Alaska, 1954-63, by Guy C. Powell and Richard E. Reynolds, Informational Leaflet 55, 10 pp., illus., processed, April 30, 1965, Department of Fish and Game, Subport Bldg., Juneau, Alaska 99801.

LABOR LEGISLATION:

Information on the Equal Pay Act of 1963, WHPC Publication 1104, 10 pp., printed, May 1965. Wage and Hour and Public Contracts Divisions, U. S. Department of Labor, Washington, D. C. 20210. The 1963 amendment to the Fair Labor Standards Act requires that men and women performing equal work must receive equal pay. This pamphlet outlines the types of jobs to which the equal pay provisions apply (generally those concerned with interstate and foreign commerce), what is meant by "equal pay" and "equal work," and what action can be taken by any person who has a question about the applicability of the equal pay standard.

LATIN AMERICA:

"La pesca y el problema alimenticio de la America Latina" (The fisheries and the food problem in Latin America), article, *Industrias Pesqueras*, vol. 39, no. 907, Feb. 1, 1965, pp. 56-57, printed in Spanish, single copy 50 ptas. (about US\$0.85). *Industrias Pesqueras*, Apartado 35, Vigo, Spain.

LIBYA:

Foreign Trade Regulations of the Kingdom of Libya, OBR 65-29, 8 pp., printed, May 1965, 15 cents, Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

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MACKEREL:

Influence of External Factors on the Schooling of Jack Mackerel in the Gulf of Aden, by V. V. Nekrasov, JPRS 25966, 3 pp., processed, 1964. (Translated from the Russian, *Okeanologiya*, vol. 4, no. 3, 1964, pp. 477-478.) Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Port Royal and Braddock Rds., Springfield, Va. 22151.

"Vliyaniye vneshnikh faktorov na skopleniya stavridy v Adenskom zalive. (Po materialam 2-1 ekspeditsii Azovo-Chernomorskogo nauchno-issledovatel'skogo instituta morskogo rybnogo khozyaistva i okeanografii v Indiskii okean)" (Effect of external factors on the accumulation of horse mackerel, Carangidae, in the Gulf of Aden--From the findings of the Second Expedition of the Azov-Black Sea Research Institute for Marine Fisheries and Oceanography in the Indian Ocean), by V. V. Nekrasov, article, *Okeanologiya*, vol. 4, no. 3, 1964, pp. 477-478, illus., printed in Russian, Akademiia Nauk SSSR, Moscow, U.S.S.R.

MOLLUSKS:

Effects of Synthetic Surfactants on the Larvae of Clams (M. MERCENARIA) and Oysters (C. VIRGINICA), by Herbert Hidu, 9 pp., printed. Reprinted from *Journal Water Pollution Control Federation*, Feb. 1965, pp. 262-270. Water Pollution Control Federation, 4435 Wisconsin Ave., Washington, D. C. 20016.

MUSSELS:

Tennessee River Mussel Investigation--A Progress Report, F65Ff1, 4 pp., printed, 1965. Tennessee Valley Authority, Fish and Wildlife Branch, Norris, Tenn. Discusses the investigation started in July 1963 by the TVA to determine the causes of mussel population depletion in the Tennessee River. Although the investigation is still not complete, the evidence to date points toward several causes, according to this leaflet. Overharvesting, changes in habitat (lack of current or impoundment), pollution, and siltation are all factors in the decline of the mussel population and consequent drop in production of the commercially valuable shell. Regulatory measures suggested to reverse the trend include licensing of operators, limiting the size of harvested shell, control over harvesting gear, limiting operations to daylight hours, and designating sanctuaries where mussels would be undisturbed.

NORTHWEST ATLANTIC:

Fishery on Georges Bank, by V. Tutichev, 43 pp., printed in Russian, 1964. Knizhnoe Izdanie, Kaliningrad, U.S.S.R.

Fishes of the Western North Atlantic, Part 4, 600 pp., illus., printed, 1965, \$27.50. Sears Foundation for Marine Research, Bingham Oceanographic Laboratory, Yale University, New Haven, Conn. This volume includes studies on the little known deep-sea fish, including the Sub-orders Argentinioidea, Stomiatoidea, Esocoidae, Bathylaconioidea, and Order Gigarturoidea.

NUTRITION:

Give Yourself a Break, 8 pp., illus., printed, 1965, single copy \$0.03, lots of 25 \$0.60, lots of 50 \$1.25, lots of 100 \$2. The American Dietetic Association, 620 N. Michigan Ave., Chicago, Ill. 60611. This nu-

trition leaflet for teen-agers includes fish as one of the protective animal protein foods to be eaten daily.

OCEANOGRAPHY:

The Atlantic Continental Shelf and Slope: A Program for Study, ITS Geological Survey Circular 481, 11 pp., illus., processed, 1963. Geological Survey, U. S. Department of the Interior, Washington, D. C. 20240.

"Exploration," by G. F. M. Smith, article, *Federal-Provincial Conference on Fisheries Development*, January 20-24, 1964, Canadian Fisheries Report No. 3, pp. 35-37, printed, 1964. Department of Fisheries, Ottawa, Canada.

"The oceanographic institute in Gothenburg, Sweden," by A. A. Kirpichnikov, article, *Okeanologiya*, vol. 4, no. 3, 1964, pp. 540-542, printed in Russian, *Okeanologiya*, Akademiia Nauk SSSR, Moscow, U.S.S.R.

Opportunities in Oceanography, by E. John Long, Smithsonian Publication No. 4537, 35 pp., illus., printed, revised April 1965, 50 cents. Editorial and Publications Division, Smithsonian Institution, Washington, D. C. 20560. Emphasizes the need for young people in the rapidly expanding field of oceanography. Discusses the qualities essential to a good oceanographer, his educational background, including opportunities for scholarships and research assistantships, and special opportunities for women. Covers the various fields of oceanography and the special challenges to each, while not neglecting to relate oceanography to other branches of science. Discusses the work of oceanographers on exploration, research, survey, and monitoring cruises as well as oceanographic occupations on land, ranging from laboratory technicians to statisticians and librarians. Includes a section on the active interest in oceanography taken by the Federal Government, and a section on the special interests of private industry. Finally, the future of oceanography is presented as one of ineluctable discoveries and breakthroughs which promise to reshape our way of life.

On some Oceanographic Observations in the Southeastern Caribbean Sea and the Adjacent Atlantic Ocean with Special Reference to the Influence of the Orinoco River, by Herman G. Gade, 56 pp., illus., printed in English with Spanish abstract. (Reprinted from *Boletín del Instituto Oceanográfico*, vol. 1, no. 2, Dec. 1961, pp. 287-342.) Instituto Oceanográfico, Universidad de Oriente, Apartado 94, Cumaná, Venezuela.

Systematic Basis for Forecasting Oceanological Conditions and the Spawning of Commercial Fish, by G. K. Izhevskii, 165 pp., printed in Russian, 1964. Vsesoiuznyi Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khozyaistva i Okeanografii, Verkh. Krasnosel'skaia Ul. No. 17, Moscow, U.S.S.R.

"Voyages to discovery," article, *Via Port of New York*, vol. 17, no. 4, April 1965, pp. 6-8, illus., printed. The Port of New York Authority, 111 Eighth Ave., New York, N. Y. 10011. Discusses oceanographic vessels operated out of the Port of New York by the Lamont Geological Observatory, the Military Sea Transportation Service, an American steamship line, and a contractor of the National Science Foundation. One vessel is the Anton Bruun (formerly the Presidential yacht *Williamsburg*), which returned to port early this

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year after completing a 2-year 72,000-mile biological research study of the western half of the Indian Ocean. Ninety-one American and foreign scientists conducted investigations which yielded biological information previously unknown. The ship participated in the International Indian Ocean Expedition, a project in which more than 20 nations took part. Other vessels have sailed on cruises to obtain geological data (including one which discovered a massive deposit of gemstone diamonds off the South African Coast), and physical and chemical oceanographic information.

"World Ocean Market Report," by E. W. Seabrook Hull, article, *Geo Marine Technology*, vol. 1, no. 5, April 1965, pp. 7-25, printed, INTEL, Inc., 739 National Press Bldg., Washington, D. C. 20004.

OYSTERS:

Abstracts from *Chemical Abstracts*, vol. 60. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006:

"Biochemical studies on *Ostrea gigas*. VIII--The iron and manganese content of meat," by A. Hayashi, Feb. 3, 1964, Abstract No. 3307f.

"A sample test for freshness of shellfish (oyster) using 2, 3, 5-triphenyltetrazolium chloride," by Taisuke Mochinaga and Akira Taguchi, Feb. 17, 1964, Abstract No. 4698g.

Chromatographic Evidence of Intraspecific Genetic Differences in the Eastern Oyster, (*CRASSOSTREA VIRGINICA*), by Robert E. Hillman, Contribution No. 252, 7 pp., printed, (Reprinted from *Systematic Zoology*, vol. 13, no. 1, pp. 12-18, March 18, 1964.) Natural Resources Institute, University of Maryland, Solomons, Md.

The Volatile Sulphur Compounds of Oysters, by A. P. Ronald, and W. A. B. Thomson, 7 pp., printed, (Reprinted from the *Journal of Fisheries Research Board of Canada*, vol. 21, no. 6, 1964, pp. 1481-1487.) Queen's Printer and Controller of Stationery, Ottawa, Canada.

PAKISTAN:

"Karachi's Fish Harbour achieves results," by R. D. Lee, article, *Foreign Trade*, vol. 123, no. 11, May 29, 1965, pp. 29-30, illus., printed, single copy C\$0.25. Queen's Printer, Government Printing Bureau, Ottawa, Canada. Construction of the new fish harbor and facilities at Karachi began in 1955, the market was opened in October 1959, and marketing operations began under the management of the Fishermen's Co-Operative Society. Landings are currently running about 200 tons a day, according to the author. The harbor is about 5,400 feet by 200 feet and the depth is between 10 and 14 feet. The facilities include a jetty over 1,700 feet long, equipped with cranes for loading and unloading fish. The co-operative administers the twice daily wholesale auctioning of both fresh and cured fish. In 1963, more than 4.3 million pounds of canned and frozen shrimp worth about US\$2.7 million were exported from Pakistan.

Market Factors in Pakistan, by Larry A. Niksch and Barry Wardlaw, OBR 65-24, 12 pp., printed, April

1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

PARASITES:

NOSEMA DOLLFUSI n. sp. (Microsporidia, Nosematidae), a Hyperparasite of *BUCEPHALUS CUCULUS* in *CRASSOSTREA VIRGINICA*, by Victor Sprague, Contribution No. 243, 5 pp., illus., printed, (Reprinted from *The Journal of Protozool.*, vol. 11, no. 3, 1964, pp. 381-385.) Natural Resources Institute, University of Maryland, Solomons, Md.

PEARL CULTURE:

"How northern pearl farms are progressing," by V. Wells, article, *Australian Fisheries Newsletter*, vol. 24, no. 6, June 1965, pp. 23-26, illus., printed, Fisheries Branch, Department of Primary Industry, Canberra A.C.T., Australia.

PIRANHA:

"El Brasil contra las pirañas" (Brazil versus the piranhas), by Blas Venegas, article, *Iberica*, vol. 43, no. 34, April 1965, pp. 126-128, illus., printed in Spanish, single copy 18 ptas. (about US\$0.30), Iberica, Palau, 3, Apartado 759, Barcelona-2, Spain.

PLANKTON:

Some Euphausiids from the Gulf of Paria, Gulf of Cariaco, and the Orinoco Delta, Eastern Venezuela, by J. E. Henri Legare, 18 pp., illus., printed in English with Spanish abstract, (Reprinted from *Boletín del Instituto Oceanográfico*, vol. 1, no. 1, July 1961, pp. 3-20.) Instituto Oceanográfico, Universidad de Oriente, Apartado 94, Cumana, Venezuela.

POLAND:

"Centromor' of Poland--amongst the finest fishing vessels and equipment in the world," by J. Swiecicki and W. Piltz; "Review of achievements of Polish fishing"; "Motherships built by Poland"; "Development of factory trawlers in Poland"; "Fishing schools in Poland and research work of Marine Fishing Institute," articles, *Fishing News*, no. 2712, May 28, 1965, pp. i-vii, illus., printed, single copy 9d. (about US\$0.10), Fishing News, A. J. Heighway Publications, Ltd., Ludgate House, 110 Fleet St., London EC4, England.

"The expansion plan of Polish fishing fleet," article, *Polish Maritime News*, vol. 8, no. 80, April 1965, pp. 19-20, illus., printed, Maritime Branch, Polish Chamber of Foreign Trade, ul. Pulaskiego 6, Gdynia, Poland. The prospective expansion of the Polish fishing fleet is based on the demand for protein for nutritive and stock-breeding purposes, according to the author. A modern fishing fleet is a fundamental element in the development of sea fisheries and is a prerequisite to full utilization of the fish landed. The extension of the fishing fleet in 1966-70 will be coordinated with construction of shore bases. During that period, new vessels built will include 19 factory trawlers, 10 freezer-trawlers, 16 trawlers with freezing equipment, 4 tuna vessels, 25 large cutters, 45 small cutters, 3 motherships, and 2 refrigerated fish-transporters. This new fleet will have a catching potential of about 225,000 metric tons of fish a year. Principal species landed will be cod, flatfish, ocean perch, herring, sprat, sardines, tuna, and mackerel. It is expected that more than 70 percent of the fish

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caught will be frozen on board, which will guarantee high quality in the fish landed at ports.

POND FISHERIES:

Pond Fish Breeding, by F. M. Sukhoverkhov, 423 pp., printed in Russian, 1963, Izdatel'stvo Sel'skokhozyaistvennoi Literatury, Zhurnalov i Plakatov, Moscow, U.S.S.R.

Pond Fishing, by T. T. Solov'ev, 131 pp., printed in Russian, 1964, Pishchevaya Promyshlennost', Moscow, U.S.S.R.

PORTUGAL:

"Plan intercalar de fomento pesquero para 1965-1967 (Projected plan of fishery development for 1965-67), article, Industrias Pesqueras, vol. 38, no. 903, Dec. 1, 1964, pp. 526-528; no. 904, Dec. 15, 1964, pp. 550-551, printed in Spanish, single copy 50 ptas. (about US\$0.85). Industrias Pesqueras, Apartado 35, Vigo, Spain.

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Boiling Fish for Short Term Preservation, edited by G. N. Subba Rao, Regional Study No. 1, 21 pp., illus., processed, March 1965. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Regional Office for Asia and the Far East, Maliwan Mansion, Phra Atit Rd., Bangkok, Thailand.

PROTEIN:

"Electrophoretic analysis of fish muscle proteins," by H. M. Salem and A. M. Nagib, article, International Congress of Biochemistry, vol. 6, no. 2, 1964, p. 177, printed. International Union of Biochemistry, P. D. Desnuelle, Secretary General, Institut de Chimie Biologique, Faculté des Sciences, Place Victor Hugo, Marseilles, France.

Abstracts from Chemical Abstracts. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006:

"Proteins. 86--Isolation and properties of myoglobin from the dolphin (*Delphinus delphis*)," by M. Karadzova and others, vol. 60, May 25, 1964, Abstract No. 13478a.

"Proteins from prawn shell waste," by P. V. Kamasastri and P. V. Prabhu, vol. 59, Oct. 14, 1963, Abstract No. 9243e.

PURSE SEINING:

"Observation on Icelandic purse seining expedition," by M. Ya. Groisman, article, Rybnoe Khoziaistvo, vol. 40, no. 6, 1964, pp. 60-64, printed in Russian. Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, Moscow B-140, U.S.S.R.

QUALITY:

"Comparative studies on the determination of the degree of freshness of fresh water fish," by Josef Denfel, article, Zeitschrift für Lebensmittel Untersuchung und -Forschung, vol. 123, no. 5, 1963, pp. 354-361, printed in German. J. F. Bergmann, Leopoldstrasse 175, Munich 23, Germany.

"Research on quality, processing and products," by E. G. Bligh, article, Federal-Provincial Conference

on Fisheries Development, January 20-24, 1964, Canadian Fisheries Report No. 3, pp. 75-77, printed, 1964. Department of Fisheries, Ottawa, Canada.

SALMON:

International North Pacific Fisheries Commission, Bulletin No. 14, 92 pp., illus., printed, 1964. International North Pacific Fisheries Commission, 6640 NW. Marine Dr., Vancouver 8, B. C., Canada. Includes articles on: "Marine growth of western Alaskan sockeye salmon (*Oncorhynchus nerka* Walbaum)," by Robert H. Lander and George K. Tanonaka; "Direction of movement of salmon in the North Pacific Ocean and Bering Sea as indicated by surface gillnet catches, 1959-1960," by Richard C. Johnsen; "Direction of movement of salmon in the North Pacific Ocean, Bering Sea and Gulf of Alaska as indicated by surface gillnet catches, 1961," by Herbert A. Larkins; "Effect of direction of set and distance between nets on the salmon catch of two gillnets," by Herbert A. Larkins and Robert R. French; "Use of a discriminant function to classify North American and Asian pink salmon, *Oncorhynchus gorbuscha* (Walbaum), collected in 1959," by Roger E. Pearson.

"Multiple hemoglobins of some members of the salmonidae family," by H. Tsuyuki and R. E. A. Gadd, article, Chemical Abstracts, vol. 59, Aug. 5, 1963, Abstract No. 31165, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

"Petroleum odors in canned salmon," article, Food Technology, vol. 18, Nov. 1964, p. 119, printed, single copy \$1.50. The Garrard Press, 510 North Hickory, Champaign, Ill. 61823.

Articles from Journal of the Fisheries Research Board of Canada, single copy C\$2.00. Queen's Printer and Controller of Stationery, Ottawa, Canada:

"Redd superimposition and egg capacity of pink salmon spawning beds," by William J. McNeil, vol. 21, no. 6, 1964, pp. 1385-1396, illus.

"The species specificity and constancy of muscle myogen and hemoglobin electropherograms of *Oncorhynchus*," vol. 22, no. 1, 1964, pp. 215-217.

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Fishery and Biological Characteristics of Salmon Caught by Sport Gear in Southeastern Alaska, by Gary Finger and Robert H. Armstrong, Informational Leaflet No. 57, 60 pp., illus., processed, May 10, 1965.

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Soviet Oceanography 1964: A Trip Report, by R. S. Dietz, 24 pp., printed, April 1965. Public Information Division, Coast and Geodetic Survey, U. S. Department of Commerce, Washington Science Center, Rockville, Md. 20852. From September 14-October 9, 1964, a 6-man delegation of marine scientists, including the author, visited the Soviet Union as part of a U. S.-U.S.S.R. scientific exchange mission. During their 4-week stay, the group visited research centers in Moscow, Leningrad, Murmansk, and in the Black Sea ports of Sevastopol, Yalta, and Gelendzhik. This report gives the general impressions gained by the author during the trip; appraises the Soviet effort in oceanography; and describes institutions and installations visited, their work, and their place in the Soviet oceanographic program. There are now about 1,200 oceanographers in the Soviet Union, according to the author. Four out of about 40 universities offer training in oceanography, 2 in Leningrad and one each in Moscow and Vladivostok. The Soviet oceanographic program in the Arctic Ocean is unique in

its scope. A great strength of Soviet oceanography is the amount of support provided scientists by technicians. Each senior scientist has 5-10 assistants, which makes possible thorough evaluation of data collected. Every year, the U.S.S.R. sends a fleet of nearly 300 ships and 15,000 fishermen to Georges Bank, off the New England coast. About 50 tons of fish are landed daily during the season. The Russians operate the world's only nonmilitary research submarine, the *Severyanka*, which is used for oceanographic work in the Arctic and North Atlantic Oceans.

On the Way Towards Cheap Fish: Collection of Articles on Economy and Methods, by G. Chernyavskii, 120 pp., printed in Russian, 1962. *Sakhalinskoe Knizhnoe Izdatel'stvo*, Sakhalinsk, U.S.S.R.

Ways of Decreasing the Fixed Cost of Production in the Trawling Fleet, by G. T. Metelitsyn, and A. P. Petrova, 79 pp., printed in Russian, 1962. *Kniznoe Izdanie, Murmansk, U.S.S.R.*

Articles from Okeanologiya, vol. 4, no. 4, 1964, printed in Russian, *Okeanologiya, Akademiia Nauk SSSR, Moscow, U.S.S.R.*

"Oceanological investigations on the R/V *Zhemchug* along the continental slope," by D. E. Gershanovich and B. N. Kotenev, pp. 729-731.

"Scientific conference of the Oceanographic Commission of the Academy of Sciences of the U.S.S.R.," by R. B. Mamaeva, pp. 727-728.

VESSELS:

"The U. S. R/V John Elliot Pillsbury," by A. N. Kosarev, article, *Okeanologiya*, vol. 4, no. 3, 1964, pp. 545-546, printed in Russian. *Okeanologiya, Akademiia Nauk SSSR, Moscow, U.S.S.R.*

WEATHER CHARTS:

Eureka to Point Conception, Calif., 1965, 2 pp., illus., processed, 1965, 10 cents. Weather Bureau, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Chart shows stations displaying small craft, gale, whole gale, and hurricane warnings; explanations of warning displays; and schedules of AM and FM radio, TV, and radiophone stations that broadcast weather forecasts and warnings.

WHALES:

Articles from Vtoroe Vsesoyuznoe Soveshchanie po Izucheniyu Morskikh Mlekopitayushchikh, 1963 (The Second All-Union Conference for the Study of Marine Mammals, 1963), printed in Russian, 1963. *Akademiia Nauk SSR, Moscow B-140, U.S.S.R.*

"Kosatka Yuzhnogo polushariya" (The killer whale of the Southern Hemisphere), by M. M. Sleptsov, pp. 40-41.

"Malyi polosatik Yuzhnogo polushariya" (The Minke whale in the southern hemisphere), by M. M. Sleptsov, pp. 41-42.

"Pitanie usatykh kitov v osnovnykh promyslovnykh rai-onakh Mirovogo okeana" (The diet of baleen whales

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

in the main fishing regions of the world ocean), by S. K. Klumov, pp. 22-24.

"O strukture stada zubchatykh kitoobraznykh (Odontoceti)" (The structure of the stock of the toothed whales (Odontoceti), by V. M. Bel'kovich and A. V. Yablokov, pp. 4-5.

WHALING:

"Death of the big whales?" by John Hillaby, article, *New Scientist*, vol. 26, no. 442, May 6, 1965, pp. 358-360, illus., printed, single copy 1s. 3d. (about US\$0.20). Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

"Preliminary survey of whaling operations in the Antarctic in season 1964/65," article, *Norsk Hvalfang-*

st-Tidende (The Norwegian Whaling Gazette), vol. 54, no. 4, April 1965, pp. 82-88, 91, printed in Norwegian and English. Hvalfangerforeningen, Sandefjord, Norway.

WHITEFISH:

"O rezul'tatakh introduktsii sigov (*Coregonus lavaretus maraenoides* Poljakow, *C. lavaretus ludoga Poljakow*) v ozere Sevan" (Results of the introduction of the whitefish--*Coregonus lavaretus maraenoides* and *Coregonus ludoga*--in Lake Sevan), by M. G. Dadikyan, article, *Izvestia Akademii Nauk Armenian SSR Biologiya Nauk*, vol. 17, no. 6, 1964, pp. 41-48, printed in Russian. *Izvestia Akademii Nauk Armenian SSR Biologiya Nauk*, Yerevan, Armenian, S.S.R.

VESSELS

Correction--In the August 1965 issue, page 125, *Modern Fishing Vessels*, the address of the publisher was omitted. The address is Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Port Royal and Braddock Rds., Springfield, Va. 22151.



WORLD'S FIRST NUCLEAR-POWERED LIGHTHOUSE IN SECOND YEAR OF OPERATION

The world's first nuclear-powered lighthouse has begun its second year of operation in Chesapeake Bay, Md.

An isotopic power generator developed by the Atomic Energy Commission has been providing the power for the unmanned beacon in the U. S. Coast Guard's Baltimore Lighthouse since May 20, 1964.

The nuclear generator, designated SNAP-7B, was developed under the AEC's SNAP (Systems for Nuclear Auxiliary Power) program. The program's objective is the development of small nuclear auxiliary power sources for specialized land, sea, and space uses.

The 60-watt nuclear generator, designed to operate unattended for 10 years, supplants batteries that had to be replaced every year. Since no moving parts are involved, nothing in the generator is subject to mechanical failure. The Coast Guard has reported that the performance of the "nuclear" lighthouse has been completely reliable and generally excellent.

FISHERIES EXPERTS BEING RECRUITED FOR
TECHNICAL ASSISTANCE PROJECTS IN MANY COUNTRIES

There are many technical assistance projects in nearly all of the developing countries of the world for which the Food and Agriculture Organization (FAO) is responsible. Because the projects are expanding rapidly, there is a need for competent fisheries experts to fill the many field vacancies. The following is a list of vacancies for which FAO is now recruiting. Write to (on a confidential basis if desired): Roy I. Jackson, Director, Fisheries Division, Food and Agriculture Organization of the United Nations, Via delle Terme de Caracalla, Rome, Italy.

The following list shows the country in which the vacancy exists, the types of fisheries experts being recruited (in parentheses the approximate duration of the assignment for the fiscal year 1965/66, with a possibility for extension):

Aden: Marine Biologist (18), Turtle Biologist (6).

Argentina: Marine Biologist (18), Oceanographer (18), 2 Master Fishermen (18), Acoustics Expert (12), Fisheries Economist (18).

Caribbean: Fish Marketing Expert (18), Fish Training Expert (15), 2 Master Fishermen (18).

Colombia: Fishery Development Adviser (6).

Central America: Fisheries Economist (18), Fishing Expert (15), Fish Processing Expert (12).

Cuba: Master Fisherman (9), Fishery Development Adviser (18).

Cyprus: Fisheries Director (18).

East Pakistan: Fisheries Biologist (18), Oceanographer (12), 2 Master Fishermen (18), Training Officer (18), Fish Processing Expert (12), Marketing Expert (18), Statistician (18).

Ghana: Marine Biologist (18), Fishery Training Expert (12).

India: Fishing Gear Expert (15), Fish Processing Technologist (12), Fish Processing Technologist (6), Reservoir Fishing Expert (9), River Pollution Expert (6).

Iran: Inland Fisheries Expert (6).

Lake Kariba (Rhodesia): Fishery Technologist (18).

Nigeria: Fisheries Officer (18), Master Fisherman (15), River Fisheries Biologist (15), Marine Fisheries Biologist (17).

Philippines: Fish Marketing Expert (18), Fish Processing Expert (18). Senegal: Fishing Gear Expert (9). Syria: Marine Fisheries Expert (3). Togo: Fisheries Adviser (18). Venezuela: Marine Fisheries Expert (6). Zambia: Inland Fisheries Biologist (12).

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HIGHLIGHTS IN THIS ISSUE (SEPTEMBER 1965)



Feature

BOTTOM TRAWLING SURVEYS OF THE NORTHERN GULF OF ALASKA (Summer and Fall of 1961 and Spring of 1962)--Results of otter-trawl surveys of bottomfish and shellfish (p. 1).

Research and Development in United States Fisheries

Hake population survey off Pacific Northwest States (p. 40).

Tuna--Skipjack biological studies in Central Pacific continued (p. 20).

Trout--Great Lakes population increases through U. S.-Canadian cooperation (pp. 51 & 58).



A netload of fish caught by trawling in Bering Sea off Nunivak Island.

Foreign Fisheries

FOOD HYGIENE: FAO Commission studies international standards (p. 55).

FOREIGN FISHING OFF U. S. COASTS: Japanese and Soviet activities (pp. 16 & 34).

WHALING: Global regulations urged (p. 52).

CEYLON--seeks United States experts to train fishermen (p. 59).

JAPAN--trends in major fisheries--tuna, salmon, crab, shrimp, and trout; use of larger trawlers planned (pp. 64-71).

NEW ZEALAND--regulates scallop fishery (p. 72).

NORWAY--Fisheries Fair in Trondheim (p. 73); air-bubble curtain proves to be as effective as fishing nets (p. 73).

U.S.S.R.--plans big increase in fishing fleet and catch (p. 77).

UNITED KINGDOM--how to maintain fish quality on vessels at sea (p. 78); radiation-preservation of frozen fish (p. 79); 1965 World Fishing Exhibition (p. 79).

ALSO FISHERY NEWS FROM 18 OTHER COUNTRIES

Federal Actions Affecting Fisheries

U. S. Tariff Commission--invites public comments on free entry of temporary imports (p. 82).

Grant-in-Aid Funds--first apportionment to states under Commercial Fisheries Research and Development Act (p. 34).

Agency for International Development--gives U. S. firm two investment guarantees for African fishery project (p. 80).

Plus

Market reports--fisheries in Maine, Maryland, New Jersey, Virginia, and South Carolina; industrial products; State and Federal actions affecting fisheries; reviews of recent fishery publications throughout the world.

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